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DISEASES CAUSED BY BACTERIA AND FUNGI.

LESBOUYRIES, G., BERTHELON, & MACRIDÈS. (1935). La mammite contagieuse de la brebis due à *Bacterium mastitidis*. ["*Bacterium*" *mastitidis* **Infection of Ewes**].—*Bull. Acad. vét. Fr.* **8.** 522-528. 1 table.

According to the experience of the authors, mastitis in the ewe due to *Str. mastitidis* is of wide-spread occurrence and may cause a mortality of about 15 per cent. at each lambing. A complete examination was made of four lambs and two ewes in one flock where death in the lambs was due to pneumonia and in the ewes to mastitis. The mastitis was of the acute form with marked induration of the udder, and death occurred on the fourth day after the appearance of the first symptoms. *Str. mastitidis*, first described by DAMMANN and FREESE, was isolated from the mammary gland and from the milk. The organism is a short Gram-negative bacillus which gives a slight growth in Martin's broth and does not coagulate milk, and its fermentation properties appear to be limited to acid production from glucose. It is pathogenic for mice by intraperitoneal injection, but does not affect the guinea pig and rabbit. The authors show that there is a close relationship between this organism and organisms of the pasteurella group isolated from sheep, but distinguish it by the fact that the latter are virulent for the rabbit. So far as the prevention of this disease by vaccination is concerned, it is not possible to draw definite conclusions.—S. J. EDWARDS.

CHICON. (1935). La prophylaxie de la tuberculose. [**The Prophylaxis of Tuberculosis**].—*Rec. Méd. vét.* **111.** 210-212.

The author criticizes the latest anti-tuberculosis legislation, represented by the Act of the 7th July, 1933, and its various orders. He points out that the grants in respect of compensation and improvement of conditions are mentioned not as rights but as possibilities, and asserts that this fact alone will interfere with the harmonious working of the Act. Farmers ought to be convinced beyond doubt that their willing co-operation in the control of tuberculosis will result in their ultimate benefit, and the formation of associations to this end is urged.—N. B.

—. (1934). Danemark. Commentaires sur la loi danoise du 26 juin 1933 relative à la prophylaxie de la tuberculose chez les bovins et les porcs. [**Denmark. The Law of June 26th, 1933, on the Prevention of Bovine and Porcine Tuberculosis**].—*Bull. Off. internat. Epiz.* **7.** 1215-1228. [2 refs.]

The new law permits the employment of methods of eradication other than the strict isolation method of Bang. One method now being tried for the first time is the zone method, *i.e.*, the elimination of tuberculosis in certain small islands and in herds where 90 per cent. of the animals are of pure breed.

The use of tuberculin for immunizing cattle is prohibited, and the importation of vaccines is subject to licence. The State pays the cost of the tuberculin test in cases where the owner can guarantee the segregation of healthy from diseased cattle. A trial test may be carried out to discover the extent to which a herd is infected, the owner being at liberty to decide afterwards whether he will accept the conditions laid down for freeing the herd from tuberculosis. By a series of rules an attempt is made to ensure that only controlled and standardized tuberculin is employed. The test generally prescribed is the intradermal test, but the subcutaneous test may be authorized for private tests and for certain retests. Only one measurement is necessary in the intradermal test, namely, at 62 hours after injection, but the measuring instruments must be approved by the veterinary department and the greatest precision is insisted upon. Precise instructions as to the interpretation of the reactions are laid down.

All pigs more than three months old in breeding centres must be tested every year by the intradermal test, once with bovine and once with avian tuberculin. —F. Bullock.

Jerlov, S. (1935). Om indikationerna för provtagning vid klinisk undersökning å lungtuberkulos. **[Indications for Taking Samples at the Clinical Examination of Cattle for Pulmonary Tuberculosis]**.—*Svensk VetTidskr.* **40.** 69-87.

The author reviews the new Swedish regulations for the control of bovine tuberculosis, in which the bacteriological examination of lung mucus for the diagnosis of open cases plays an important part. This method of diagnosis is, however, a very slow and tedious one and is not free from error in that it is not safe to assume that acid-fast bacteria seen in microscopic preparations are tubercle bacilli.

The author discusses the necessity for clinical examination as a means of detecting open cases in a herd so that the more tedious lung mucus test has only to be resorted to as a confirmative one. He is of the opinion that auscultation of the chest is most important in this respect and emphasizes the need for extension of our knowledge upon this method of examination.—Gustav Naerland (Oslo).

Uganda Protectorate. (1935). **Report on Tuberculosis Research, Veterinary Laboratory, Entebbe.** [Carmichael, J.]—*Rep. vet. Dep. Uganda, 1934.* pp. 19-20.

This special report deals with the incidence and types of tuberculosis in Uganda cattle, the relationship between animal and human tuberculosis, and the susceptibility of various breeds of Uganda cattle to the disease.

Strains of the organism isolated from cattle and from a sheep all proved to belong to the bovine type. Out of 50 strains from cases of human pulmonary tuberculosis, two strains proved to belong to the bovine type of organism. Experiments conducted, or in progress, indicate that zebu cattle are no less susceptible to tuberculosis than the long-horned Ankole cattle, but up to the present no strain of *Mycobact. tuberculosis* has been isolated from zebu cattle in Uganda, in spite of the fact that microscopic lesions resembling tuberculosis have been reported from zebu carcasses.—U. F. Richardson.

GRÜNBERG, B. (1935). Ein Beitrag zur Frage der Pathogenität der Säugertuberkulose-Bazillen für Hühner. [**A Note on the Pathogenicity of Mammalian Tubercle Bacilli to the Chicken**].—*Z. Tuberk.* **74.** 194-195. [6 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 331. Signed Norman D. BALL].

To clear up the inconsistencies in the literature on this point Grünberg inoculated 30 chickens with human, bovine, and avian tubercle bacilli intravenously, subcutaneously and orally, and by combined routes. Eight were inoculated with the avian type; 3 died of the infection, the remaining 5 showed tuberculous lesions *post mortem* 6–9 months later. Ten received the human strain. One died and the bacilli were recovered *post mortem*. The remainder were free from tuberculosis at *post mortem*. Twelve received the bovine strain; 6 died in 3 weeks; of these 4 showed tuberculous lesions. These 6 were very poorly nourished before inoculation. The remaining 6 were well nourished and only one of them was infected.

I. SMITHBURN, K. C. (1935). **Colony Morphology of Tubercle Bacilli. II. Influence of pH of Culture Medium on Colony Morphology and Virulence.** —*Proc. Soc. exp. Biol., N.Y.* **32.** 1336-1338. [4 refs.] [For abst. of previous article, see this *Bull.* **5.** 601].

II. WITTE, J. (1935). Beitrag zur Züchtung von Tuberkelbakterien unter besonderer Berüchsichtigung des Typus bovinus. [**The Cultivation of the Bovine Tubercle Bacillus**].—*Z. InfektKr. Haustiere.* **48.** 14-38. 1 table. [Numerous refs.]

III. BESTA, B. (1935). Untersuchungen über die " Dissoziation " von Tuberkelbacillen. [**The Dissociation of Tubercle Bacilli**].—*Z. Hyg. InfektKr.* **117.** 403-425. 1 fig., 2 tables. [Numerous refs.]

I. The cultural characteristics of bovine types of tubercle bacilli were studied. The incorporation of glycerin or haematin did not improve growth of this organism. Malachite green had no inhibitory action and is thus valuable for selective purposes. The author considers that the best medium for growing bovine types of tubercle bacilli is a modified form of Petragnani's medium. The modifications, which are recorded in detail, include the omission of glycerin.

II. Avian types of tubercle bacilli developed as rough colonies at pH 6·0 to 6·2, and as smooth colonies on a less acid medium. Bovine types developed R colonies between pH 6·0 and 6·2, and on a less acid medium (pH 7·0 to 7·4) semi-transparent granular colonies developed, classified as " intermediate ". Human types developed R colonies between pH 6·0 and 6·2, S between pH 6·4 and 6·6, and " intermediate " between pH 6·8 and 7·4.

III. According to the author, tubercle bacilli are not divisible into R and S variants having low and high virulence. Actually such cultures are mixtures of virulent and avirulent types, both types having R and S variants. The avirulent type is a saprophytic contaminant of the virulent tubercle bacilli. [A hypothesis of this type is difficult to confirm or disprove by experiment. Unless single cell culture is carried out, it is merely a matter of opinion whether an avirulent type be named a variant or a contaminant of the original culture. Single cell culture is at present inapplicable to mycobacteria].—E. J. PULLINGER.

I. BRANCH, A. (1933). **A Study of Acid-Fast Organisms Other than Mammalian Tubercle Bacilli Isolated from Disease in Man. The Occurrence of Avian Tubercle Bacillus Infection of Men and the Diagnosis of Avirulent Avian Tubercle Bacilli.**—*Tubercle, Lond.* **14.** 337-353. 6 figs., 1 table. [Numerous refs.]

II. Feldman, W. H. (1936). **Observations on Certain Unidentified Acid-Fast Bacteria Obtained from Cattle.**—*J. Amer. vet. med. Ass.* **88.** 166-172. 1 table. [7 refs.]

I. This is a study of several strains of acid-fast bacilli, not mammalian tubercle bacilli, which have been isolated by different investigators from disease in man. Four of these strains were shown by cultural examination, animal inoculation, and their ability to form tuberculin and sensitize fowls to a known avian tuberculin, to be typical avian tubercle bacilli. Other strains were shown not to be true tubercle bacilli and yet could not be regarded as saprophytes in view of their association with disease in man.

The author claims to have demonstrated the pathogenic properties of these intermediate strains by experimental inoculation of white mice. After large intraperitoneal doses multiple abscesses develop in the kidneys: this is considered to be a useful guide in the identification of these unusual strains.

II. Feldman tested the value of Branch's method of injecting white mice to determine the character of certain acid-fast bacilli which were neither typical tubercle bacilli nor true saprophytes [see I]. For this purpose he used human, bovine and avian strains of *Mycobact. tuberculosis*, *M. phlei*, two bovine " skin lesion " strains and an apparently non-pathogenic acid-fast bacillus from a mesenteric gland of a reactor cow. The organisms of tuberculosis exhibited the expected pathogenicity for mice and the causal organisms were recovered from the spleens of the mice. The mice injected with the four other strains failed to give rise to the kidney lesions observed by Branch and the organisms could not be recovered from the spleens. In view of these results their pathogenic significance is doubtful.

—Gwilym O. Davies.

De Fosset, A. J. (1936). **Johne's Disease, a Menace to the Cattle Industry.**—*J. Amer. vet. med. Ass.* **88.** 352-360. [1 ref.]

The author made a survey, largely by means of a questionnaire, in the various states of the U.S.A.; 33 out of 41 states reported the existence of the disease, 4 states reported an increase and 31 states no increase in incidence.

In this report the diversity of test agents and their mode of application is emphasized, and also the different state measures for dealing with reacting animals. The consensus of opinion gathered is that it is almost impossible to eradicate the disease from infected herds by means of biological agents now in use and the author quotes his own experiences on this subject and those of Cotton and of Hagan & Zeissig [see this *Bull.* **6.** 7].

He concludes that research work should be directed to improving biological tests, that infected herds should be located and movement therefrom be prohibited except for slaughter, and that extensively infected herds should be slaughtered and compensation given.—C. V. Watkins.

Heck, J. H. (1935). Vaccinatie tegen septichaemia epizoötica in een gedeelte van de onderafdeeling Makale-Rantepao, afdeeling Loewoe, gewest Celebes en onderhoorigheden in het tweede halfjaar 1934 (47e vaccinatie). [**Vaccination against Haemorrhagic Septicaemia in West Celebes, July to December, 1934**].—*Ned.-ind. Bl. Diergeneesk.* **47.** 271-281. 3 tables.

This article deals with prophylactic immunization against haemorrhagic septicaemia in a district with about 20 thousand water-buffaloes and 13 thousand pigs. 19,014 water-buffaloes, 12,949 pigs and 112 cows were vaccinated and kept under observation for six months. Within six days of the vaccination (negative phase) three water-buffaloes and four pigs died, government compensation being

paid. Between three and six months after vaccination only one water-buffalo died. Of the non-vaccinated animals in the same district, 76 water-buffaloes and 164 pigs died during the six months of control. With the former preventive and curative serum treatment, 12·7 and 2·8 per thousand fatal cases occurred, but when prophylactic vaccination was administered, the death rate was only 0·26 and 0·3 per thousand respectively in buffaloes and cattle.—M. J. J. H. (ROTTERDAM).

NELSON, J. B. (1935). **Cocco-Bacilliform Bodies Associated with an Infectious Fowl Coryza.**—*Science.* **82.** 43-44. [2 refs.]

The author states that he has constantly found minute Gram-negative cocco-bacilliform bodies in the exudates of birds originally infected with filtrate. They vary in size from 0·1 to 0·5μ and, although usually extracellular, may be found in phagocytic or epithelial cells. All attempts to cultivate the organism have failed. The relationship of these bodies to the aetiology of coryza rests as yet on purely circumstantial evidence. [A condition like coryza is also caused by avitaminosis A : there may be some connexion between them – see this *Bull.* **6.** 451 and 452].—GWILYM O. DAVIES.

BEACH, J. R. (1935). **Coryza and Other Respiratory Infections in Chickens.**—*12th Int. vet. Congr. 1934.* **3.** 144-160. [30 refs.] [French, German and Spanish summaries].

This report discusses what appear to be three distinct forms of respiratory infections in chickens :– (1) the virus disease, infectious laryngotracheitis, which is of great economic importance – an apparently successful form of cloacal or bursal vaccination is described ; (2) infectious bronchitis, tracheitis and coryza in chicks, a disease affecting chicks from two days to three weeks of age, due to a virus apparently unrelated to that of infectious laryngotracheitis, and (3) an uncomplicated form of infectious coryza of which NELSON [this *Bull.* **5.** 471 and 602, and **6.** 9.] has reported three types and DE BLIECK one type.

DELAPLANE, STUART and BUNYEA [this *Bull.* **4.** 262.] observed a coryza in chickens and pheasants in Rhode Island, and Beach and his co-workers a similar disease in California [(1933). *Nulaid News.* **11.** 7].—GWILYM O. DAVIES.

I. FRANCKE, G., STANDFUSS, R., & WILKEN, H. (1934). Die Bekämpfung der Enteritiserkrankung des Rindes nebst weiteren Beobachtungen über diese Krankheit. [**Control of *Salmonella enteritidis* Infection in Cattle**].—*Berl. tierärztl. Wschr.* **50.** 753-759.

II. RASCH, K., & LORENZEN, P. (1935). Erfahrungen bei der Bekämpfung der Enteritis in Rindviehbeständen in den Regierungsbezirken Breslau und Liegnitz. [**Control of *S. enteritidis* Infection of Cattle around Breslau**].—*Ibid.* **51.** 749-753.

III. RASCH, K., & LORENZEN, P. (1935). Gibt es Dauerausscheider von Breslau-bakterien in Rindviehbeständen ? [**Cattle as Carriers of *S. typhi-murium***].—*Ibid.* 801-802.

IV. BUCHBINDER, L., HALL, L., WILENS, S. L., & SLANETZ, C. A. (1935). **Observations on Enzootic Paratyphoid Infection in a Rat Colony.**—*Amer. J. Hyg.* **22.** 199-213. 3 tables. [9 refs.]

V. SCHRAMEK, J. (1935). Ueber den heutigen Stand der Typhus-Diagnose bei Mensch und Tier. [**The Present Status of Paratyphoid Diagnosis in Animals and Man**].—*Vet. Gesundheitsdienst.* Suppl. to *Prag. tierärztl. Arch.* pp. 17-26. 1 table. [9 refs.]

I. Report of the examination of 1,717 bovines in 48 herds for salmonella

infection. Animals in more than half the herds were infected with *S. enteritidis* or *S. typhi-murium*. No active excretors of infection were found amongst 411 animals in ten *S. typhi-murium*-infected herds.

II. 1,412 bovines were examined for infection with *S. typhi-murium* and *S. enteritidis* by faeces culture and by the agglutination reaction. Of these, 4·25 per cent. were excreting infection, but only 0·28 per cent. were considered to be permanent excretors.

III. A report of the excretion of *S. typhi-murium* by a bovine over a period of at least five months.

IV. An enzootic infection of *S. enteritidis* in a colony of laboratory rats is described. The questions of excretion of infection, morbid anatomy, natural resistance of young stock and development of antibodies were studied.

V. The modern method of classifying the *Salmonella* genus according to antigenic structure is discussed. The salmonella infections of animals are considered under the headings :– (a) primary paratyphoid infections including calf, pig and piglet paratyphoids, equine and ovine abortion, *S. pullorum* infection, fowl typhoid and rodent typhoid ; (b) bovine enteritis including the *S. enteritidis* and *S. paratyphi* B infections, and (c) secondary paratyphoid including *S. cholerae-suis* infection of pigs.—E. J. Pullinger.

Felix, A., & Pitt, R. Margaret. (1936). **The Vi Antigens of Various Salmonella Types.**—*Brit. J. exp. Path.* **17.** 81-86. 3 tables. [5 refs.]

A reliable method for separating " Vi " and " O " antibodies in a serum prepared against *S. typhi* consists of absorption with acid-treated bacteria, as " O " antigens but not " Vi " antigens are highly resistant to the action of hydrochloric acid. On the other hand, suspensions treated with alcohol will still absorb both " Vi " and " O " antibodies. Using this technique, " Vi " antigens were demonstrated in other species of salmonella.

There is not apparently the marked difference between strains of other members of the group that there is between the highly virulent " Vi " antigen-containing strains of *S. typhi* and those of less virulence and not containing this antigen. This has been one reason why the " Vi " antigen remained obscure in certain species.

The " Vi " antigens of *S. typhi* and *S. paratyphi* C apparently overlap, as also the " Vi " antigens of *S. paratyphi* B and *S. typhi-murium*, whereas the " Vi " antigen of *S. paratyphi* A is apparently specific.—R. Lovell.

Curbelo Hernandez, A., Insua Cartaya, G., & Toyos Gomez, V. (1935). Un caso de infeccion humana por " Salmonella suipestifer ". (Estudio bacteriológico y consideraciones de orden práctico). [**Human Infection by *Salmonella cholerae-suis***].—*Rev. Parasit. clin. lab.* **1.** 107-116. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 100. Signed H. H. S.]

The patient's occupation brought him into contact with cattle and pigs. He had suffered from intestinal disturbances and later with signs of inflammation of the urinary tract, a " nephropyelocystitis ". The left renal pelvis was washed out and from the washing *Bact. suipestifer* was grown ; a vaccine was prepared and a considerable degree of improvement is said to have followed its use. After a brief apyrexial interval (4 days) osteo-arthritis of the left hip set in with destruction of the joint. Operation was performed and the wound drained ; from the pus the same organism was isolated. Some two years later there was still discharge and the *Bact. suipestifer* was still present. The author recalls other cases, diagnosed sometimes as typhoid fever, with involvement of joints (in one case the shoulder)

in which organisms of this group have been isolated but no attempt has been made to identify them with certainty and, seeing that " salmonelloses of different species, especially that due to Morgan's bacillus, are very frequent in the country, especially in rural districts in the summer ", it is quite probable that careful investigation would discover more cases of human infection by *Bact. suipestifer.*

HOFFMANN, F. (1935). Járványszerü gerincbénulás angol kocák és kanok között. [**Epidemic Spinal Paralysis in English Sows and Boars**].—*Allatorv. Lapok.* **58.** 205-207. 5 figs. [3 refs.]

This paper deals with 14 cases of spinal paralysis in an English herd in Hungary, and with investigations to ascertain their aetiology. Animals showing paralytic symptoms were killed and their spinal columns examined. In all cases lesions consisting of erosions, periostitis, exostosis or necrosis were detected, involving one or more vertebrae. As abortion was of frequent occurrence in the herd, all animals showing paralysis were tested for *Brucella abortus* agglutinins and 85·72 per cent. yielded positive reactions. The author concludes that, though inoculations of guinea pigs with necrotic bone material gave a positive reaction to *Br. abortus* in only one case, the lesions and, in consequence, the paralytic symptoms were due to *Br. abortus.*—A. KOTLÁN (BUDAPEST).

BENNETTS, H. W. (1935). **The Occurrence of Bacillus Pullorum Septicaemia in Adult Hens in Western Australia.**—*Aust. vet. J.* **11.** 223-227. [7 refs.]

Salmonella pullorum infection is recorded from Western Australia for the first time, an unusual feature of the outbreak being that it was confined to birds between ten and 12 months old. Some 300 to 400 hens died, usually within 24 hours of first showing symptoms. The liver, heart and kidneys showed small areas of necrosis and there was enteritis.

Bennetts isolated an organism and identified it as *S. pullorum* by agglutination and fermentation tests. Inoculation of pure culture and of blood from affected birds produced lesions comparable to those seen in the cases occurring naturally, although the birds did not die. Haematological examination of affected birds which lingered for some days showed a marked anaemia.

The outbreak is believed to be an authentic case of *S. pullorum* septicaemia uncomplicated by any intercurrent infection.—W. I. B. BEVERIDGE.

WILSON, D. E. (1936). **Human Brucellosis in Tanganyika Territory.**—*Trans. R. Soc. trop. Med. Hyg.* **29.** 363-368. [16 refs.]

BENZONI, G. (1936). Malta- und Bangfieber in Italien ; gegenwärtiger Stand der Bedeutung, Verbreitung und Bekämpfung. [*Brucella melitensis* **and** *Br. abortus* **Infections in Italy ; their Importance, Spread and Control**].—*Arch. Schiffs- u. Tropenhyg.* **40.** 260-265. 1 table. [Numerous refs.]

In Tanganyika, undulant fever is encountered caused by both CO_2-sensitive and non-CO_2-sensitive strains of *Br. abortus.* No therapeutic measures have proved to be of real value.

In Italy, an average of one to two thousand cases of brucella infection of human beings are reported annually. There is a seasonal fluctuation of incidence which reaches its highest level in May and its lowest level in December.—E. J. P.

MAMELI, I. (1935). Sul potere di associazione dei germi del gruppo Brucelle con i batteri del gruppo tifo-coli e stafilococco. [**Association of Brucella Group with Bacteria of the Colon-Typhoid Group and with Staphylococci**].—

G. Batt. Immun. **14.** 1119-1127 and 1128-1133. 4 tables. [25 refs.] [English, French and German summaries : abst. from orig.]

MAMELI, I. (1935). Nuove osservazioni sul comportamento dei germi del gruppo Brucella sui terreni vaccinati dei batteri del gruppo tifo-coli e stafilococco. [**Growth of Brucella on Media previously Used for the Growth of Colon-Typhoid Bacteria and Staphylococci**].—*Nuovo Ercol.* **40.** 181-187. [2 refs.]

The author studied the antibiosis which exists between brucella and members of the colon-typhoid group of bacteria. Broth, agar and liver-agar cultures of these organisms were incubated for 24 to 144 hours and the bacteria removed by washing with saline or by centrifuging. The media were then heated for one hour at 70°C. and reinoculated with the organism under examination. It was found that *Br. melitensis* and *Br. para-melitensis* failed to grow on media which had previously grown *Br. abortus* and *vice versa* but, whereas brucella failed to grow on media which had previously grown *Salmonella typhi* and *S. para-typhi* A and B, the reverse was not the case.

In order to determine the cause of the lack of growth of brucella on media which had previously grown colon-typhoid bacteria, four-day agar cultures of the latter organisms were heated at 100°C. for 30 minutes and inoculated with brucella. In no case did the brucella develop, even after prolonged incubation. The addition of fresh or sterilized fruit juice to the tubes, or the removal of the surface of the medium before reinoculation, did not induce the brucella to grow. The author concludes that the phenomenon is a true antibiosis and is not due to exhaustion of nutritive substances in the media.

In another series of experiments, it was found that guinea pigs inoculated with *Br. melitensis* and colon-typhoid bacteria produced a serum with a normal titre against the former but a low titre against the latter and that guinea pigs, inoculated with a brucella and with *S. typhi*, agglutinated both at the usual titre. Finally, it was found that the agglutinating titre of serum from guinea pigs inoculated with brucella and with one of the colon-typhoid bacteria became gradually reduced against the brucella, whilst it gradually increased against the other bacteria as the interval between inoculation and testing was lengthened.—J. A. NICHOLSON.

FAVILLI, G., & BIANCALANI, G. (1934). Ricerche sulle sostanze idrocarbonate specifiche dei batteri del gruppo brucella. [**Isolation of a Polysaccharide from *Brucella abortus***].—*Sperimentale.* **88.** 337-344. 1 fig., 1 table. [5 refs.] [English, French and German summaries : abst. from orig.]

Previous attempts to obtain a specific polysaccharide from *Br. abortus* have not been satisfactory but, as a result of their work on *Br. melitensis* and *Br. para-melitensis*, the authors have developed a new method. The technique is as follows. The growth is washed off 72-hour liver-agar cultures, filtered, centrifuged, and 100 c.c. of saline added to every 10 g. of bacilli obtained. The material is then heated for four to five hours on a water-bath at 100°C. and extracted with absolute alcohol. The extract is concentrated to $^1/_{20}$th of its volume and a gelatinous, white precipitate is obtained. This is dissolved in water and precipitated twice with absolute alcohol, redissolved in water and precipitated with 6 per cent. uranyl acetate slightly acidified with acetic acid. The precipitate thus obtained is separated by filtration, treated with sodium phosphate and the uranyl phosphate removed by filtration. Magnesium mixture is then added to the filtrate and the magnesium ammonium phosphate removed by filtration. The filtrate is concentrated to a small volume and precipitated with absolute alcohol. The polysaccharide thus obtained does not give any protein reactions and occurs as a white powder, extremely soluble in water. It is optically active and, after acidification with

4 per cent. sulphuric acid, reduces Fehling's solution. Crystallization takes place after hydrolysis and the addition of 20 drops of phenylhydrazine. The crystals melt at 203° to 205°C.

Serologic tests have shown that precipitation of the polysaccharide takes place with dilutions up to 1 : 500,000 of anti- *abortus*, *melitensis* and *paramelitensis* sera. —J. A. NICHOLSON.

I. WOODRUFF, H. A. (1936). **Some Toxaemias of Animals due to Anaerobic Organisms. A Comparative Pathological Study of Recent Work with Particular Reference to the Toxaemia of Intestinal Obstruction in Man.**—*Brit. med. J.* Feb. 29th. 406-409. [12 refs.]

II. —. (1935). **Anaerobic Infections.**—*Ibid.* Oct. 19th. 747-749.

III. LESBOUYRIES, & BERTHELON. (1936). Entero-toxémie du lapin. [**Entero-Toxaemia in the Rabbit**].—*Bull. Acad. vét. Fr.* **9.** 74-82. 2 figs.

I. This is an abstract of a paper read at the Annual Meeting of the British Medical Association, Melbourne, 1935. The author describes the fundamental work of several investigators upon two anaerobic sheep diseases (infectious necrotic hepatitis and infectious entero-toxaemia) and suggests that many papers dealing with human anaerobic infections need revision in the light of these findings. The conditions necessary for the establishment of *Clostridium welchii* infection in human tissues, the typing of the strain of bacteria involved and the presence (potential or actual) of latent spores must all be considered anew.

II. A discussion on the above paper. HERCUS referred to the possibility of nutritional factors in the aetiology of infectious necrotic hepatitis. He did not think that intestinal stasis played an important part. OXER referred to the vaccination of ewes, as for lamb dysentery, against infectious entero-toxaemia. The further discussion emphasized the complexity of the toxins of *Cl. welchii* bacteria and the fact that *Cl. ovitoxicum* infections are confined to ruminants.

III. The authors describe an entero-toxaemia of rabbits due to *Cl. welchii* infection. The disease is prevalent in the Paris area and generally occurs between January and June. It is readily transmissible by ingestion. It appears to belong to that group of anaerobic diseases principally occurring in animals being fed on a high production ration (for meat, milk or muscular effort).—C. V. WATKINS.

KRANEVELD, F. C., & DJAENOEDIN, R. (1935). Anaërobe bacillen en de door hen veroorzaakte infecties bij de huisdieren in Nederlandsch-Indië. XVII. Onderzoek over de vorming van indol door anaërobe bacillen, speciaal wat betreft de gasbacil van Fraenkel, de boutvuur- en de paraboutvuurbacil. [**Anaerobic Diseases of Domestic Animals in the Dutch East Indies. XVII. Indol Formation by Anaerobes**].—*Ned.-ind. Bl. Diergeneesk.* **47.** 231-250. 3 tables. [Numerous refs.] [English and German summaries : abst. from orig.] [For abst. of previous articles of this series see this *Bull.* **6.** 217].

The contradictory communications in literature about the formation of indol by anaerobic micro-organisms induced the authors to test a great number of strains of such bacteria in the collection at the Veeartsenijkundig Instituut. A short review is given of the chemistry and the technique of the reaction. The culture medium used was Frieber's trypsine-broth containing 1 per cent. peptone and a mixture of equal parts of liver-broth and trypsine-broth (5 per cent. peptone), with or without an alkali to neutralize the acids which develop when cultures are stored.

A negative result was obtained with *Clostridium welchii* (250 samples), *Cl. chauvoei* (60 samples), *Cl. septique* (30 samples) and *Cl. botulinum* (8 samples).

Seven of 8 samples of *Cl. tetani* quickly gave a positive reaction, the eighth sample only after repeated tests. A negative reaction was seen with one or two samples of the following organisms :– *Cl. oedematiens*, *Cl. histolyticum*, *Cl.* [?] *carnis*, the lamb-dysentery bacillus, *Cl. paludis*, *Cl. ovitoxicum*, *Cl. putrificum*, *Cl. tyrosinogenes*, *Cl. multifermentans* and *Cl. butyricum*. A positive result was obtained with *Cl. bifermentans*.

The results were in keeping with those of KOVÁCS, HOFFMANN, and other workers, and the differences between the various strains of *Cl. tetani*, with regard to the amount of indol formed, could be confirmed.

—M. J. J. HOUTHUIS (ROTTERDAM).

TRILLAT, A. (1935). Influence des agents extérieurs sur la vitalité des microbes en suspension dans l'air. **[The Influence of External Agencies on the Vitality of Organisms Suspended in the Air]**.—*Mouvem. sanit.* **12.** 667-673. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 318. Signed J. C. CRUICKSHANK].

This paper is a résumé of the conclusions reached in a study of the spread of disease by droplets expelled during speaking or coughing. In addition to the larger droplets and those smaller ones which may be projected for several metres, the author recognizes those very minute droplets which remain suspended almost indefinitely and those formed in moist air by condensation round nuclei of dried organisms. A formula for determining the rate of fall of particles, dependent on their size and density, the density of the air and other factors is given. The effect of various agencies such as air-currents, gravity and electricity is considered. Amongst other observations the author mentions the deposition of organisms on cold objects, the precipitation of particles when atmospheric pressure falls rapidly and the longer survival of bacteria in humid expired air. He records the sensitization of guineapigs to normal horse serum administered as a fine spray, and suggests tentatively that immunization by attenuated organisms might be carried out in a similar manner. The attraction of cold surfaces for suspended particles might in his opinion find a practical application in sick rooms, hospitals and operating-theatres.

DISEASES CAUSED BY PROTOZOAN PARASITES.

MARCHESI, F., & SCAPATICCI, R. (1935). **On Certain Serological Tests Used in the Diagnosis of Leishmaniasis in Dogs.**—*J. trop. Med.* (*Hyg.*). **38.** 225-226. [10 refs.]

MARCHESI, F., CRAINZ, F., & SCAPATICCI, R. (1935). **Investigations on the Seasonal Variations of Canine Leishmaniasis in Rome.**—*Ibid.* 226-229. 2 tables, 1 graph. [Numerous refs.]

PAPANTONAKIS, E. (1936). Die Leishmaniosen in der Provinz Messinia (Peloponnes, Griecherland). **[Leishmania Infection in the Province of Messina (Greece)]**.—*Arch. Schiffs- u. Tropenhyg.* **40.** 141-146. 3 figs., 1 table. [4 refs.]

In the first paper the authors record the testing of the sera of 100 dogs by the formol-gel and water precipitation tests for leishmaniasis. Four sera gave positive reactions to one test and five to the other test, but only one serum was positive to both. The animal providing this serum was proved to be infected.

The second paper records investigations made into the prevalence of canine leishmaniasis in Rome. Eighteen cases were detected and it was found that the

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Veterinary Laboratory,
Ministry of Agriculture & Fisheries,
Weybridge,
Surrey, England.

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An annual volume in crown quarto size would run to about 1,600 pages and a number, consisting of about 400 pages, would be issued each quarter. The index would be prepared on a Gestetner duplicator: the sheets would be printed on one side only and would be clear to read. Each quarterly number would be glued and stitched and would be well-bound with a printed paper cover similar to that of the Veterinary Bulletin.

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IMPERIAL BUREAU OF ANIMAL HEALTH,
Veterinary Laboratory,
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New Haw,
[illegible], Surrey.

disease in dogs exhibited a seasonal prevalence, being most common in summer and autumn, reaching a peak of 6·2 per cent. in November, but disappearing entirely in December. The cases of the disease which occurred in the spring exhibited skin lesions, but infections occurring in the summer and autumn produced no visible symptoms. The authors consider that the human leishmaniasis which is most prevalent in the spring is contracted by contact with infected dogs in the autumn.

The third article records that in Messina human kala-azar and canine leishmaniasis are prevalent in the mountainous part of the province but absent in the plains area, although dogs are found in both areas. *Phlebotomus major* is more numerous in the wooded mountain country than it is on the plains.—U. F. R.

Nicolau, S., & Lwoff, A. (1935). L'action pathogène de *Trichomonas foetus* pour le système nerveux central. [**Pathogenic Action of** *Trich. foetus* **on the Central Nervous System**].—*Ann. Inst. Pasteur.* **55.** 654-675. 24 figs. [1 ref.]

This article records the results of the intracerebral and subdural inoculation of *Trich. foetus* into rabbits, guinea pigs, mice, rats, dogs, monkeys and fowls. Fowls showed temporary disease, from which they appeared to be recovering when slaughtered, and the rats remained apparently healthy though trichomonads could be detected in their brains. The other animals all developed a meningo-encephalomyelitis, which might be acute, subacute or chronic and was usually fatal. The parasites displayed a preference for the grey matter of the brain and invaded the cavities of the ventricles. Destruction of brain tissue occurred and an invasion of the lesions by polynuclear, mononuclear and giant cells, the latter performing the function of phagocytes of the protozoa.—U. F. Richardson.

Andrews, J., & Rees, C. W. (1936). **Experimental** *Trichomonas foetus* **Infection in Sheep.**—*J. Parasit.* **22.** 108.

This note records the experimental infection of five non-pregnant ewes with *Trich. foetus* by the intravaginal injection of vaginal washings from an infected heifer. The ewes remained irregularly positive for over five months but, on the slaughter of one ewe, no gross pathological lesions of the genitalia could be detected, though trichomonads had invaded both horns of the uterus. A ram which served these ewes failed to become infected, nor could it be infected by the injection of a culture of *Trich. foetus* into the preputial sac.—U. F. Richardson.

Pommier, M., & Sautet, J. (1936). La piroplasmose et la nuttaliose équines en Corse. Observations et remarques sur le traitement. [**Equine Piroplasmosis in Corsica**].—*Bull. Soc. Path. exot.* **29.** 38-41.

Babesia equi and *B. caballi* infections both occur to a limited extent in Corsica, principally among imported horses. The latter condition is the more serious. The authors give a clinical record of two cases of each disease. Pulmonary symptoms were shown in all cases. Intravenous injections of "gonacrine" proved effective against *B. equi* infection only.—C. Davenport.

Rossi, P. (1936). La piroplasmose équine vraie. Observations cliniques, hématologiques et thérapeutiques. [*Babesia caballi* **Infection in Horses. Observations on Symptoms, Haematology and Therapeutics**].—*Rev. vét., Toulouse.* **88.** 7-25. 1 fig., 10 tables. [Numerous refs.]

This article gives a brief history of *B. caballi* infection in France, the disease having been first recognized in 1924. The disease is seasonal, occurring from

April to June, is described as always acute, and attacks equines of all classes and ages, cases in foals of ten and 13 days old being on record. In many instances no tick infestation could be detected though specimens of *Dermacentor reticulatus* could be collected in the infected area.

In the cases under observation by the author, haemoglobinuria was not detected macroscopically though haemoglobin could be demonstrated by Weber's reaction. The urine might be normal, or coloured brown by bile pigment; albumin was present; the amount of urea was less than half the normal quantity. Cardiac symptoms were marked and very persistent, necessitating prolonged convalescence.

The blood is described as very fluid and difficult to dry on slides, the corpuscles agglutinating along the walls of test tubes. The serum was greenish, the green pigment dissolving in alcohol or water. In sedimentation tests, the settlement of the corpuscles was remarkably rapid and the corpuscular index remarkably low within 48 hours of the appearance of symptoms. The leucocyte count showed a progressive increase in the proportion of mononuclear cells with a decrease of polymorphonuclear and transitional forms.

The red corpuscles exhibited little abnormality and the giant forms of Baruchello were not detected; the resistance to saline solutions indicated an abnormal fragility.

In spite of the acute form of the disease, parasites were rare in the blood, rarely exceeding 1 per 15 fields. No marked alteration in blood calcium could be detected, but the blood cholesterin was reduced and uraemia was always marked. Treatment with " gonacrine " caused a rapid drop in the blood urea, which, however, again rose above normal.

The urea-stibamine reaction and the formol-gel reaction proved to be of no value in diagnosis, whilst the sublimate reaction of Fulton, though positive, would fail to differentiate the disease from infectious anaemia.

" Novarsenobenzol " did not give satisfactory results in treatment but, out of about 200 animals treated by the intravenous injection of 20 c.c. of a 5 per cent. solution of " gonacrine ", in only one case did the temperature fail to drop to normal within 48 hours.—U. F. Richardson.

DISEASES CAUSED BY VIRUSES.

Merrill, M. H. (1936). **The Mass Factor in Immunological Studies upon Viruses.**—*J. Immunol.* **30.** 169-184. 1 fig., 1 table. [Numerous refs.]

It has been suggested that the reason immunological reactions have sometimes not been obtained with viruses *in vitro* is that an insufficient concentration of virus particles has been used. The author deals with the purely physical consideration of the mass of the antigenic particles taking part in immunological reactions and discusses the relationship between the size of antigenic particles and the number of particles necessary to produce visible reactions. It is concluded that a definite threshold concentration of antigenic particles must be reached before positive reactions *in vitro* are obtainable.—James Stewart.

Cèbe, & Perrin. (1935). Conservation du virus de la peste bovine par passages sur le lapin. [**Conservation of Rinderpest Virus by Rabbit Passage**].—*Bull. écon. Indochine.* **38.** 795-798.

The authors have succeeded in conserving rinderpest virus in two series of rabbits for 46 and 36 passages respectively over a maximum of eight months. The

first rabbits of the two series were inoculated subcutaneously with lymph from the thoracic duct and blood from infected calves respectively; a number of calves tested at intervals with rabbit blood and spleen developed rinderpest, which, however, was much milder than the true cattle-borne disease. The rabbits showed little or no indisposition whilst infected with rinderpest. [For work on the passage of rinderpest virus in rabbits, see EDWARDS (1924) – *Rep. Bact. (bact. Lab.) Muktesar, 1923-1924.* p. 32].—J. E.

PONOMARENKO, F. M., & SLABOSPITZKY, T. P. (1936). O nekotorych klìničeskich i anatomičeskich projavlenijach pri IEM u losadeji. [**Symptoms in Equine Encephalomyelitis**].—*Sovyet. Vet.* No. 1. pp. 29-31. [French summary: abst from orig.]

The authors discuss certain lesions useful from the diagnostic point of view. They suggest that sufficient prominence has not been given by other authors to the importance of some of these lesions. The necrotic odour of the mouth is characteristic. Small spots, up to 5 mm. in diameter, are present on the tongue in the early stages of the disease; there are petechiae on the vaginal mucous membrane. Dry undigested food is found in the stomach.

Changes observed in the liver are discussed, but only a few details are given. Some details are given of the authors' observations on cerebrospinal fluid, which increases in amount. The authors describe a few cases.

HOLZ. (1935). Ein Beitrag zu der hämorrhagischen Enzephalitis der Pferde in Württemberg. [**Haemorrhagic Encephalitis of Horses in Württemberg**]. —*Z. InfektKr. Haustiere.* **48.** 70-76. [4 refs.]

In a previous publication [this *Bull.* **5.** 625.] the author described a type of encephalitis which differed from Borna disease in certain respects. The histological changes found in the central nervous systems of two horses are described. These animals had previously suffered from Borna disease and histological evidence of this fact was still available in the form of long-standing vascular and perivascular depositions of iron. In addition, more recent and acute lesions of vascular and perivascular lymphocyte infiltration as well as haemorrhage were demonstrable, these lesions being characteristic of the recently described haemorrhagic encephalitis. The findings in the two horses are considered further evidence that this disease is distinct from Borna disease, and that the latter infection produces no immunity against the former.—E. J. PULLINGER.

HOLZ. (1935). Beiträge zur Erforschung der Kopfkrankheit der Pferde in Württemberg. [**Encephalomyelitis of Horses in Württemberg**].—*Z. InfektKr. Haustiere.* **48.** 238-247. [13 refs.]

During a survey of various forms of equine encephalomyelitis which occur in Württemberg, two apparently new types have been encountered. Symptoms are not characteristic. Histologically the one type is characterized by the development of multiple subependymal haemorrhages and the appearance of non-sudan-staining reticular cells. The second type of encephalomyelitis is characterized by the appearance of large-nucleated glial cells and evidence of neuronophagia. The destruction of neurons results in widening of the interstitial lymph channels.

On histopathological evidence, these two conditions appear to differ from Borna disease and from haemorrhagic encephalitis [this *Bull.* **5.** 625]. The nature of the causes is at present a matter for speculation, but it is suggested that one or both types of disease may be identical with the condition which is commonly known as " Dummkoller ".—E. J. PULLINGER.

Plantureux, E. (1936). Au sujet de l'application en France de la vaccination antirabique des chiens avant morsure. [**Antirabic Vaccination of Dogs in France**].—*Rev. vét., Toulouse.* **88.** 65-74.

The author discusses the case for and against the introduction of prophylactic antirabic vaccination of dogs in France. Statistics show that the existing method of controlling rabies in dogs in France (destruction and isolation of suspected animals), has resulted in reducing the number of rabid dogs and of people given the Pasteur treatment after being bitten, but that the numbers show no sign of reaching zero. The author suggests that the vaccination of dogs in France, as carried out in North Africa, would help to eradicate the disease. He mentions that the Syndicat National Vétérinaire, at a meeting in 1935, passed a unanimous resolution on the desirability of taking this step [see, however, the resolutions of the Office International des Epizooties – this *Bull.* **6.** 336, also 665 and 710]. —J. E.

I. Levaditi, C., & Schoen, R. (1935). Evolution du virus vaccinal et du virus rabique des rues dans l'épithélium cornéen. [**The Development of Vaccinia Virus and Street Rabies Virus in the Corneal Epithelium**].—*C. R. Soc. Biol. Paris.* **119.** 706-709. 4 figs. [1 ref.]

II. Remlinger, P., & Bailly, J. (1936). Action du ricinoléate de sodium sur les virus de la rage et de la maladie d'Aujeszky. [**Effect of Sodium Ricinoleate on the Viruses of Rabies and Aujeszky's Disease**].—*Ibid.* **122.** 24-25.

I. The progressive development of Guarnieri bodies during the course of vaccinia infection has been studied. Following infection of scarified cornea, basophile filaments appear in the cell cytoplasm of corneal cells within ten hours. By the 24th hour these filaments have aggregated into vacuoleated clumps which by the second day resemble typical Guarnieri bodies. Lesions are confined to the inoculated eye whereas, in rabies, inclusion bodies very soon appear also in the uninoculated eye.

II. Sodium ricinoleate has a marked inactivating effect upon the viruses of rabies and Aujeszky's disease. Consequently it is not possible to differentiate these two viruses by means of the action of this chemical.—E. J. Pullinger.

Jármai, K. (1935). Zur Produktion und Artspezifizität des Agens der Hühnerleukose. [**Cultivation and Specificity of the Agent of Fowl Leucosis**].—*Arch. wiss. prakt. Tierheilk.* **70.** 62-70. [8 refs.]

The femur bones were removed from a healthy fowl, the epiphyses were sawn off, one bone was immersed in boiling water for a few minutes and both bones were placed in the abdominal cavity of a healthy fowl which was infected intravenously with leucosis material ; the fowl died in seven days as a result.

Four fowls were inoculated with washings of the implanted femora from this bird, a pair each from each bone, and one of them receiving material from the unboiled bone contracted leucosis.

The causal agent was not strongly species-specific, as it affected not only fowls but also guinea fowls, pheasants and turkeys. Striking and sudden changes in virulence resulted from a single passage through a turkey. This fact is offered as evidence that the causal agent is a cell product and not a viable organism. —E. J. Pullinger.

Seddon, H. R., & Hart, L. (1935). **The Occurrence of Infectious Laryngo-Tracheitis in Fowls in New South Wales.**—*Aust. vet. J.* **11.** 212-223. 7 figs. on 2 plates, 2 tables. [4 refs.]

Infectious laryngotracheitis in fowls is recorded from New South Wales for the first time.

The clinical and pathological features of the disease encountered, together with its highly contagious nature, strongly suggested that it was identical with infectious laryngotracheitis as described by BEACH in the United States of America. Cross-immunization experiments carried out with American virus both by the authors and by MOHLER in America showed the two diseases to be identical. Cross-immunity experiments showed no antigenic difference between several outbreaks in N.S.W. BURNET, who collaborated with the authors, was able to propagate the virus on the chorio-allantoic membrane of developing eggs and the lesions so produced agreed with those described by BEACH. Cultures on developing eggs reproduced the disease in fowls.

Usually about 48 hours elapse between artificial infection and the appearance of symptoms, the chief of which are violent coughing and gasping breathing. The incubation period is usually from six to ten days when infection takes place by contact. Evidence of the existence of carriers was obtained when three out of 37 swabs taken from recovered birds reproduced the disease in other birds.

The clinical features and history of 12 outbreaks are recorded in detail. In the peracute type, which is characterized by haemorrhagic tracheitis, 80 to 100 per cent. of the flock becomes affected and 10 to 15 per cent. may die, death usually occurring on the second day after the onset of symptoms. In the *acute* type there is no haemorrhage into the trachea, but the mortality may be as high as 40 per cent. Transmission of the disease from the acute type is sometimes not possible. In the *chronic* type the chief symptoms are unthriftiness and oral breathing, and the lesions are diphtheresis of the upper air passages, sometimes with panophthalmia. An *asymptomatic* type of the disease is recognized since certain birds exposed to infection show no symptoms but are later found to be immune.

The disease occurs mainly in birds under one year old. Differential diagnosis is discussed. The best means of differentiating the chronic form from the diphtheritic form of fowl pox is to inoculate material into (a) the comb, and (b) the trachea of experimental fowls, when typical lesions of either disease should develop.

Intratracheal injection, by means of a pipette passed through the glottis, was the routine method of inoculation used for reproducing laryngotracheitis. Spraying or swabbing the throat, intranasal injection, instillation into the conjunctival sac and contact with infected birds also led to infection. Infection was sometimes, but not constantly, produced by intraperitoneal or subcutaneous injection and by oral administration in the drinking water or food. The infective dose of tracheal exudate from infected birds, either fresh or after five days' storage, was 0·000125 ml., and of cultures on developing eggs 0·000066 g. The disease could not be set up with emulsions of various internal organs of infected birds. The serum of recovered birds neutralized the virus when mixed with it for an hour before inoculation. The disease could not be reproduced in turkeys, ducks, starlings, quail, pigeons, sparrows, guinea pigs, rabbits, rats or mice, but MOHLER was able to infect pheasants with virus sent to him.—W. I. B. BEVERIDGE.

PARASITOLOGY (DISEASES CAUSED BY HELMINTH PARASITES).

KOROPOV, V. (1935). Eksperimentalnye dannye o vlijanii glistnogo faktora na serdečno-sosudistuju sistemu. [**Effect of Helminth Substances on the Blood Pressure**].—*Med. Parasitol., Moscow.* **4.** 281-287. [French summary]. [Copied *verbatim* from *Helminth. Abstr.* **4.** 143. Signed B. G. P.]

Koropov has investigated reduction of blood pressure in dogs following injection of the following substances, all of which were thermostabile: excretions of *Toxascaris canis* (which lived 16 to 24 days in saline at 37°C.), disintegration products of the ascarids, of *Multiceps multiceps*, and of *Taenia hydatigena*. Blood pressure was markedly reduced by injection into the jugular vein and (in heavy doses) into the hepatic portal vein, but no reduction followed after vagotomy, after injection into the carotid artery, after introduction into the intestine, or after injection in small doses into the portal vein. These results show that reduction is a reflex due to stimulation of the vagus, and that the liver can neutralize such " toxins " in limited quantities.

Plotnikov, N., & Zertschaninov, L. (1935). K faune trematod pečeni čeloveka i domasnich plotojadnych Tobolska. [**Trematoda of the Liver of Man and Domestic Carnivora in Tobolsk**].—*Med. Parasitol., Moscow.* **4.** 330. [Copied *verbatim* from *Helminth. Abstr.* **4.** 143. Signed B. G. P.]

Opisthorchis felineus was the only liver fluke found among some 30,000 from man and 50,000 from dogs and cats in Tobolsk.

Coutelen, F. (1936). Certains oiseaux carnivores sont-ils susceptibles de servir d'hôtes définitifs à la forme adulte du ténia échinocoque? (Contrôle expérimental). [**The Role of Birds of Prey in the Dissemination of** *T. echinococcus*].—*C. R. Soc. Biol. Paris.* **121.** 401-403. [4 refs.]

Four kestrels, one buzzard, three owls and one crow were each given 1 c.c. of hydatid sand, estimated to contain 400,000 scolices of *T. echinococcus*, the activity of which was observed microscopically.

None of the birds showed any unusual symptoms and at *post-mortem* examination 75 to 80 days after the infection no adult *T. echinococcus* were found in any of them, nor did the digestive tract nor its accessory organs show any visible lesions.

The author concludes that birds of prey cannot harbour *T. echinococcus* and do not play any part in the dissemination or maintenance of echinococcus, as Fontana has suggested they may do in Uruguay. The temperature of birds is higher than that of the normal mammalian host of *T. echinococcus* and this may be one among other physico-chemical factors which condition the specificity of parasitic species to their hosts [see de Waele, this *Bull.* **5.** 360].—G. Lapage.

Vassilkova, Z. (1935). Degelmintizacija fekalii, soderzaśich jaica *Ascaris lumbricoides*. [**Sterilization of Faeces containing Eggs of** *Ascaris lumbricoides*].—*Med. Parasitol., Moscow.* **4.** 288-298. [Copied *verbatim* from *Helminth. Abstr.* **4.** 143. Signed B. G. P.]

Vassilkova has tested the action of a number of disinfectants on eggs of *Ascaris lumbricoides*. Results of exposure for varying times at varying concentrations are given, showing that, e.g., 5 % phenol or 10% lysol must be applied for 5 hours in order to kill the eggs. The general conclusion is that heat is a more effective agent, and that in sterilizing manure for fertilizing purposes the biothermic method (composting) should be relied upon.

Underwood, J. R. (1936). **Habronemiasis.**—*Vet. Bull. U.S. Army.* **30.** 16-28. [5 refs.]

The author records the results of his studies of habronema infections in equines. His observations, which were carried out in the United States of America and the Philippine Islands, cover a period of six years and are based upon the *post-mortem* findings in 254 horses and mules.

He commences by briefly reviewing the life-history of *H. muscae* and then passes to a detailed study of gastric habronemiasis. He states that he has been unable to obtain any success in the diagnosis of this condition during life. Cutaneous habronemiasis is next considered and arguments are advanced in support of the contention that the larvae found in " summer sore " lesions are those of habronema. The procedure for the examination of tissue for larvae is given.

Habronemic dermatosis and conjunctivitis are next dealt with and the methods of examination of flies for larvae are described. The theory that gastric infection arises as a result of ingestion of flies is discussed.

In the paragraphs dealing with treatment, some original work is recorded. Carbon bisulphide proved of no value in gastric habronemiasis unless lavage with warm 2 per cent. sodium bicarbonate was practised beforehand. Arsenic trioxide proved effective against *H. muscae* and *H. microstoma*. Its effect upon *H. megastoma* was not observed as animals affected with this parasite were not available. In the treatment of " summer sores " glycerin combined with a fly repellent proved effective.—C. Davenport.

IMMUNITY.

Hankin, T. H. (1935). **Modifying Effect of the Subcutaneous and Single Intradermal Tuberculin Tests upon Each Other when Carried out simultaneously.** —*Aust. vet. J.* **11.** 227-229. 2 tables.

Fourteen cattle, which a year previously had reacted to the intradermal tuberculin test, were subjected simultaneously to this and the subcutaneous test. Only two reacted to the subcutaneous test and seven to the intradermal test, although all were found infected on *post-mortem* examination. Sixteen other infected cattle, when tested by the intradermal method alone, all gave positive reactions, most of these being more definite than the positive reactions obtained when the subcutaneous test was also applied.

These results suggest that when the intradermal and subcutaneous tests are applied simultaneously, they so modify each other that neither is reliable. —W. I. B. Beveridge.

Clawson, B. J. (1935). **Relation of Allergy and Lesions in Animals Vaccinated with B.C.G.**—*Arch. Path.* **19.** 673-678. 2 tables. [6 refs.]

When rabbits were vaccinated with living and heat-killed BCG a positive reaction to the Mantoux test was given only by those animals in which lesions developed as a result of the vaccination. Allergy never developed in the absence of a lesion. It was also found that, in allergic animals, subsequent infection with BCG produced extensive lesions, whereas lesions seldom or never developed in normal animals.

The author concludes that these experiments support the belief that without a lesion in tuberculosis infection there is no allergy, and that the allergic state produces a marked increase in the susceptibility to the development of lesions. —N. J. Scorgie.

Shtoutser, M. J., & Fedotoff, J. F. (1936). Raspoznavanie brucelleza u ovec pri pomosći vnutrikoznoj reakcii po Djubua. [**Diagnosis of Brucella Infection in Sheep by the Intradermal Reaction (Abortin)**].—*Sovyet. Vet.* No. 1. pp. 4-10. 1 table. [French summary : abst. from orig.]

Brucellin, prepared according to the method described by Dubois, yielded good results in tests carried out mainly on sheep.

The authors prepared a brucellin using a *melitensis* culture, passing it through ten generations of white mice, and finally growing it for three days on glucose agar, 0·5 per cent. formaldehyde being added to the suspension. Parallel experiments with this brucellin were carried out on sheep with heated and unheated material.

The authors give figures of flocks tested. Brucellin tests yielded a much higher percentage of reactors than the agglutination tests.

ZILIN, M. G. (1935). Reakcii allergii pri brucelleze. [**Allergic Reactions in Brucella Infection**].—*Rev. Microbiol., Saratov.* **3.** 225-230. 3 tables. [German summary : abst. from orig.]

The author carried out experiments on human beings, using the agglutination, Meinicke, complement-fixation, intradermal and endermic tests, in the latter case both with and without scarification. He gives full details of the antigens used and of their preparation. He considers the best antigen for all tests to be a killed broth culture, without preservatives. In cases where a large number of tests have to be made, he recommends the endermic test with scarification, which is both simple and specific. He sets forth the results of his experiments in tables.

DUBOIS, C. (1936). Caractères de la réaction locale provoquée par l'injection, sous la peau, de *Brucella abortus* vivants, en excipient gras, chez la vache et la brebis. [**Local Reaction Produced by Subcutaneous Inoculation into Cows and Ewes of Living** *Br. abortus* **in a Fatty Excipient**].—*C. R. Soc. Biol. Paris.* **121.** 10-13. [1 ref.]

The excipient of the vaccines used in these experiments was slightly different from that noted in a previous abstract [see this *Bull.* **5.** 797]. The amount of live *Br. abortus* varied from 0·5 to 1 mg. for ewes and goats and from 4 to 8 mg. for cows. [1 mg. = about 2×10^9 bacteria].

The author analyses the effect of the constituents of the vaccines when injected subcutaneously into sheep.

The swelling is warm, painful and oedematous after 24 hours ; after several days it becomes tumefied and painless ; it never suppurates or discharges. The size varies from that of a hazel nut in ewes to larger than a hen's egg in cows : with few exceptions it persists for at least eight months. There is a transitory systemic reaction lasting for about three days.—C. V. WATKINS.

FABIANI, G., & KEHL, R. (1936). Les bases histologiques de l'immunité locale obtenue par injections d'antivirus. [**The Histological Basis of Local Immunity Produced by Injections of Antivirus**].—*C. R. Soc. Biol. Paris.* **121.** 347-348. [6 refs.]

Intradermal inoculation of staphylococcal antivirus into guinea pigs provoked a local cellular reaction consisting mainly of plasma cells, "polyblasts" and polymorphonuclear leucocytes. The severity of the reaction appeared to vary with the peptone-content of the medium and with the concentration of the products of bacterial disintegration. Leucocytic response was most prominent after the introduction of culture filtrate, and in particular after the administration of antivirus. There also appeared to exist a direct relationship between the intensity of the cellular reaction and the resulting immune state.—J. W. EMSLIE.

KALININ, W. S., SCHERESCHEWSKAJA, N. I., & SEILKOWA, R. E. (1935). Zur Frage des Reizes zur Antikörperbildung in vivo. [**On the Stimulation of Antibody Production** *in vivo*].—*G. Batt. Immun.* **15.** 681-700. 3 tables.

[20 refs.] [In German : English, French and Italian summaries]. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 327-328. Signed W. W. C. Topley].

The authors record a series of experiments on the augmentation of antibody production in rabbits by the subcutaneous, or intravenous, injection of sera of various kinds. The sera employed in most of their experiments were obtained from rabbits that had received injections of extracts of guineapig tissues, and had hence developed a high content of heterophile antibody. They also tested rabbit sera containing anti-sheep haemolysin, and normal sera obtained from the rabbit, sheep or horse. The sera were injected during, or shortly after, a series of injections of bacterial antigens (*Bact. typhosum* or *Bact. paratyphosum B*), or of sheep's red corpuscles. The results indicated that a much higher average titre of agglutinins, or of haemolysins, was developed in the rabbits receiving the heterophile, or haemolytic, sera than in untreated rabbits. The injection of the normal sera led to some increase in antibody production, but the difference was much less marked than with the two immune sera.

Felix, A., & Pitt, R. Margaret. (1934). **A New Antigen of *B. typhosus*. Its Relation to Virulence and to Active and Passive Immunization.**—*Lancet.* **227.** 186-191. 6 tables. [16 refs.]

Felix, A. (1935). **Clinical Trials with a New Antityphoid Serum.**—*Ibid.* **228.** 799-802. 5 tables. [1 ref.]

—. (1936). **Serum Treatment of Typhoid Fever.**—*Brit. med. J.* Feb. 22nd. 380-382.

Petrie, G. F. (1936). **Therapeutic Action of Anti-Typhoid Serum. [Correspondence].**—*Ibid.* Feb. 29th. 443-444.

Goodall, E. W. (1936). **Therapeutic Action of Antityphoid Serum. [Correspondence].**—*Ibid.* March 14th. 553.

As far as *Salmonella typhi* is concerned, virulence is intimately associated with resistance to the action of the " O " antibody. The factor responsible in virulent strains for both the inagglutinability and virulence is an antigen which is separate from the " O " and " H " antigens. The symbol " Vi ", referring to virulence, is suggested both for this antigen and its corresponding antibody. It appears from this work that virulence and toxigenicity of *S. typhi* are independent of each other, the " O " antigen and its corresponding antibody being largely concerned in toxigenicity. The efficacy of a therapeutic antityphoid serum would, therefore, depend on the presence in it of :– (a) " Vi " antibody which would confer protection against highly virulent strains by suppressing the multiplication of *S. typhi*, and (b) " O " antibody which is chiefly responsible for effecting the neutralization of the endotoxin of *S. typhi*.

A total of 43 patients were treated during various stages of typhoid fever with this type of serum, whilst 17 controls were treated with normal horse serum. The general condition of most of the 17 controls was rather worse after treatment with normal horse serum than before. The small number treated with specific serum does not permit of any statistical calculation, but a number of patients were considered to have been saved by serum treatment, whilst in a number of less gravely ill persons the fever period was shortened.

At a meeting of medical officers, Felix outlined the work which led up to the preparation and clinical trials of this type of antityphoid serum, and considered the results to have been encouraging. McSweeney, having used this serum, felt that it was justifiable to employ it as a routine treatment in typhoid fever, especially if toxaemic features were in evidence. Goodall brought various criticisms to bear, especially as to why serum treatment was of benefit to some but not to other

patients. There was a danger of assuming that experimental results in mice were applicable to man and there was a possibility that the results obtained were non-specific. These criticisms were answered in correspondence by Petrie, who stated that neither criticism was valid. From experience with other therapeutic sera the mouse protection test is of value and any non-specific therapeutic action is virtually non-existent compared with the specific neutralizing action of specific sera. In his reply, Goodall pointed out the difference in the type of disease artificially engendered in mice and the natural disease in man in which intestinal ulceration occurred with sometimes a subsequent mixed infection.—R. Lovell.

van Deinse, F. (1936). Recherches sur les propriétés du sérum provenant de lapins immunisés par des bacilles tuberculeux aviaires morts, vis-à-vis de ces mêmes bacilles vivants. [**Properties of the Serum of Rabbits Immunized by Live or Dead Avian Tubercle Bacilli**].—*C. R. Soc. Biol. Paris.* **121.** 723-724. [1 ref.]

In a previous publication [this *Bull.* **6.** 695.] the author, with Loukidis, showed that rabbits could be immunized by repeated doses of heat-killed S avian tubercle bacilli against massive intravenous doses of the same organism. The serum of such an immunized rabbit was mixed with varying amounts of living avian bacilli, incubated for periods of from 24 to 72 hours and injected into rabbits. All the inoculated rabbits died of tuberculosis after varying periods. These results would appear to contradict the recent work of Massol and Schiavo and de Santis, which tended to indicate that such serum might possess protective properties. —A. W. Taylor.

Schulz, R. E., & Schichobalowa, N. (1935). Immunitet pri gelmintozach. [**Immunity in Helminth Infestation**].—*Med. Parasitol., Moscow.* **4.** 257-280. [German summary]. [Copied *verbatim* from *Helminth. Abstr.* **4.** 143. Signed B. G. P.]

In a 20-page review of recent work on helminthic immunity, covering 116 references to published literature, Schulz and Schichobalowa conclude that there is ample evidence for innate as well as for acquired immunity to worm infections. They draw comparisons with the established theories of bacterial immunity.

Viebrock. (1935). Blutgruppenbestimmung bei Pferden der Kavallerieschule. [**Blood Groups in Horses**].—*Z. Veterinärk.* **47.** 289-302. 7 tables. [18 refs.]

Viebrock finds that the method of grouping described by Rüscher is simple and satisfactory. Cells should be fresh, but sera should be five to six days old before use. Observations on seven horses suggest that the properties are inherited. Of 115 blood samples examined, 110 were typed, *viz*, A B O (40 per cent.), A anti-B (33·63 per cent.), B anti-A (21·81 per cent.) and O anti-A B (4·54 per cent.). Thorough-breds were usually A B O or A anti-B, and others chiefly B anti-A. No marked difference was found between different types of school and hack horses. [Presumably, A anti-B corresponds to the usual term Aβ, B anti-A to Bα, and O anti-AB to O$\alpha\beta$].—A. W. Stableforth.

DISEASES, GENERAL.

I. Flückiger, G. (1935). L'appui apporté par l'état à la lutte contre l'avortement épizootique des bovidés à brucella et la mammite streptococcique des vaches laitières. [**State Control of Bovine Contagious**

Abortion and Streptococcus Mastitis, Switzerland].—*Bull. Off. vét., Berne.* **36.** 240-243.

II. Flückiger. (1935). Appel en faveur de la lutte contre l'avortement épizootique des bovidés pendant l'estivage. [**Appeal for a Campaign against Bovine Contagious Abortion, Switzerland**].—*Ibid.* 47-48, 54-56, 69-70, and **37.** 27-29 and 38-41.

III. Obrecht. (1935). Prescriptions concernant la lutte contre l'avortement épizootique des bovidés à brucella. [**Control of Bovine Contagious Abortion, Switzerland**].—*Ibid.* **36.** 190-193.

IV. Flückiger. (1935). Instructions relatives à la lutte contre l'avortement épizootique des bovidés à brucella. [**Instructions relating to the Control of Bovine Contagious Abortion, Switzerland**].—*Ibid.* 220-223.

V. Gräub, E. (1935). Directives sur la lutte contre l'avortement épizootique des bovidés. [**The Control of Bovine Contagious Abortion, Switzerland**]. —*Ibid.* 232-238. [1 ref.]

VI. Obrecht. (1935). Prescriptions concernant la lutte contre la mammite streptococcique contagieuse des vaches laitières. [**Control of Streptococcus Mastitis in Switzerland**].—*Ibid.* 193-196.

VII. Flückiger. (1935). Instructions relatives à la lutte contre la mammite streptococcique contagieuse des vaches laitières. [**Instructions relating to the Control of Streptococcus Mastitis, Switzerland**].—*Ibid.* 223-225.

VIII. Steck, W. (1935). Les conditions essentielles à observer pour rendre efficace la lutte contre la mammite streptococcique. [**Principles of Control of Streptococcus Mastitis, Switzerland**].—*Ibid.* 238-240.

These articles are of comparative geographic interest in that they show the part taken by the state in the control of bovine tuberculosis, contagious abortion and mastitis in Switzerland.

By a resolution passed by the Federal Council in August, 1935, voluntary control schemes for contagious abortion and mastitis were instituted, whilst bovine tuberculosis was dealt with similarly in March, 1934.

I. A general educational article for farmers.

II. The danger of summer pasturage in the spread of contagious abortion is emphasized and detailed instructions for the prevention and arrest of infection are given.

III. The voluntary control scheme is described in detail and the farmer's obligations are made clear. All the instructions follow orthodox practice and the use of any kind of vaccine is prohibited.

IV. Technical instructions for veterinary surgeons are given. An agglutination titre of 1 : 80 upwards is regarded as positive. A scheme of compensation for slaughtered infected animals is in force, 80 per cent. of the full value being allowed.

V. A general discussion of the principles and practice of the voluntary eradication scheme.

VI. The voluntary control scheme and the farmer's obligations are given in detail.

VII. Technical instructions for the veterinary surgeon and laboratory worker.

VIII. A general technical discussion. Udder infusion therapy by any one of four methods, using " uberasan ", " entozon " or " trypaflavine " is recommended, but animals which fail to respond to two or three treatments should be slaughtered.—J. E.

Dixon, J. K. (1936). **Investigations on a Sheep Ailment in Southland.**—*N.Z. J. Sci. Tech.* **17.** 600-619. 10 tables.

Lambs unweaned and weaned become weak, show definite signs of malnutrition and finally die in the Morton Mains area of the South Island of New Zealand. This unthriftiness can be combated by better farming methods such as grazing cattle on the grass prior to the ewes and lambs. The rainfall of the area is high and the pasture is as a rule difficult to control with sheep alone.

Some suspicion has existed in the minds of chemists that this may be an iron deficiency. Experimental drenching with limonite, soils, manganese sulphate, iron and ammonium citrate, iodine, livermeal and milk, has taken place, but benefit has occurred mainly when soils have been administered. Such soils are fairly high in iron but two samples were also high in cobalt. Beneficial drenches have on the whole been higher all round in all minerals than have those drenches not proving beneficial.

Veterinary opinion, backed by parasite counts, is that the condition is due to parasitic invasion with trichostrongyles and coccidia.

A further paper should appear on a second season's trials just completed.
—C. S. M. Hopkirk.

Mahajan, M. R. (1935). **Some Observations on " Circling " Disease of Sheep in Hyderabad State.**—*Indian J. vet. Sci.* **5.** 350-354. 6 figs. on 2 plates. [2 refs.]

The author describes a disease of sheep known locally as " tirgudu potrogam ", signifying " circling " disease and previously referred to as a gid-like disease.

Severe losses occur between June and August, sometimes perennially and in other cases every two or three years; they appear to be confined to certain districts. Ewe-hoggets are usually attacked because it is the practice to kill off the males at an earlier age. All sheep over four months old are said to be susceptible. About 500 sheep died during 1934; 20 of these were kept under observation until death. The symptoms shown are a progressive dulness with loss of co-ordination of movement. The sheep appears to be affected with encephalitis. When moved it turns either to the right or the left, the circle gradually becoming smaller until the animal falls on its side and dies with its head and legs extended, after struggling and laboured respiration. Death occurs within six to 18 hours of the onset of symptoms.

Post-mortem examination only showed an engorgement of the blood vessels of the brain and spinal cord with a blackening of the meninges, probably due to stasis of the venous blood. Detailed laboratory findings of all organs submitted for examination at the Research Institute, Muktesar, are appended.

Field transmission experiments upon five sheep were attempted, each being different, but they were unsuccessful. The *post-mortem* examination of one of these sheep revealed nothing abnormal.

The resemblance of this disease to the " circling " disease of sheep reported from New Zealand by Gill [this *Bull.* **4.** 461.] is noted. Further investigation is in progress.—C. V. Watkins.

Zago, V. (1935). Osservazioni e rilievi sulla paraplegia enzootica degli equini. [**Enzootic Paraplegia of the Horse**].—*Profilassi.* **8.** 60-63. [English and French summaries : abst. from orig.]

The author records outbreaks of this disease in three foals and two mules, the symptoms in each case being essentially similar. Muscular spasms and a staggering gait were pronounced in the early stages of the disease; later the

animals fell frequently and had great difficulty in getting up. Sensibility, however, was never totally lost and the animals showed signs of hunger. In one case, although the animal was completely paralysed, it took food into its mouth readily but was unable to swallow. Exophthalmia was pronounced, the conjunctiva cyanotic, and the pulse rapid, but the temperature remained normal. One foal and the two mules recovered after an illness lasting several days. On *post-mortem* examination of the two foals which died, the subcutaneous tissues were found to be infiltrated and haemorrhagic, there was an abundance of blood-stained peritoneal fluid, enlargement of the spleen and mesenteric glands and degenerative changes in the liver and kidneys. Pure cultures of *Streptococcus melanogenes* were obtained in both cases.—J. A. Nicholson.

Peck, E. F. (1936). **An Outbreak of Infectious Conjunctivitis and Dacryocystitis in Troop Ponies.**—*Vet. Rec.* **16.** 283.

An outbreak of conjunctivitis in troop ponies in Somaliland proved resistant to treatment until irrigation of the eye and lachrymal sac by way of the lachrymal duct *via* the nasal opening was introduced. Obstruction of the duct was the explanation. "Chinosol" and "acriflavine" were the drugs employed and for injection purposes a 2 oz. syringe with a blunt needle was used. The author found that in some cases attempts at irrigation in this manner might be defeated owing to the existence of secondary openings along the course of the duct. The symptoms exhibited and the main characteristics of the outbreak are described. The condition was transmitted and aggravated by flies until eye fringes for the ponies were introduced as a protection.—C. Davenport.

Ásvány, E. (1934). Adatok a szopós csikók járványos tüdógyulladáának kóroktanához. [**The Aetiology of Contagious Pneumonia of Foals**].—*Allatorv. Közl.* **31.** 131-134.

Taking into consideration his experience of many years, the author expresses the view that predisposing factors play the most important role in the incidence and spread of contagious pneumonia of foals, particularly at the beginning of an outbreak. Control measures should, therefore, consist not only in the improvement of sanitary conditions by disinfection and stable hygiene, but also in the careful elimination of all possible predisposing factors. The author considers that rational feeding of the pregnant mares and strict maintenance of scientific principles in the regulation of the mating periods are the most beneficial means in the control of this disease.—A. Kotlán (Budapest).

Schijns, H., & Belleflamme, M. (1935). L'emphysème des regains chez la bête bovine. [**Pulmonary Emphysema in Cattle grazing on Aftermath**]. —*Ann. Méd. vét.* **80.** 508-512.

The authors describe a condition of milch cows which occurs in the late autumn in a limited area in France. It commences a few days after the animals are let out on to aftermath. They develop attacks of more or less acute dyspnoea and a cough; the milk yield falls, but the digestive system remains in good order. Deaths have been observed, but can be prevented in early cases if the animals are housed. Fatal cases show extensive pulmonary emphysema and sometimes subcutaneous emphysema.—J. E.

van Hooydonk, P. C. M. (1935). Overzicht van haematologische onderzoekingen bij enkele ziekten van paard en rund; bijdrage tot de kennis van het normale witte bloedbeeld van het varken. [**Blood Picture in Horse and**

Cattle Diseases. Normal Leucocyte Picture of Swine].—*Inaug. Diss., Utrecht.* pp. 191. 6 tables. [Numerous refs.]

The author gives the details collected about the variations in the leucocyte count from the history-sheets of animals treated at the Clinic for Large Domestic Animals, Utrecht, from 1913 to 1933. The following conclusions are stressed :–

In horses the course of a disease can be prognosed favourably from the appearance of a normal total number of leucocytes or a moderate hyperleucocytosis with a normal cell-proportion, low neutrophilia, eosinophilia, lymphocytosis or a reappearance of eosinophile leucocytes. A low or diminishing total number of leucocytes with eosinopenia and/or a diminishing percentage of neutrophile leucocytes is unfavourable. Hyperleucocytosis with neutrophilia in horses is symptomatic of tuberculosis, abscesses or worm aneurisms.

In cattle the leucocyte count is of little value in prognosis, but a low total number of leucocytes is unfavourable, as also are eosinopenia and a very strong hyperleucocytosis. Hyperleucocytosis in cases of pericarditis in cattle is an indication of trauma and a normal number of leucocytes or leucopenia is an indication of tuberculous pericarditis or hyperpericardium. Hyperleucocytosis (15,000) with neutrophilia in young cattle is not an indication of rickets, but of polyarthritis. Leucopenia in cattle is an indication of tuberculosis.

On an investigation into the blood picture of 90 pigs, the author gives as the normal number of leucocytes 9,000 to 18,000 per c.mm. A neutrophile (68 per cent.) as well as a lymphocytic (73 per cent.) blood picture is to be seen in apparently normal swine. The total number of leucocytes in healthy pigs of the same herd may fluctuate from 15,800 to 26,400 in the course of a few hours.

—M. J. J. Houthuis (Rotterdam).

I. Hutt, F. B. (1934). **A Hereditary Lethal Muscle Contracture in Cattle.**—*J. Hered.* **25.** 41-46. 1 fig., 1 table. [7 refs.]

II. Koch, W. (1935). Neue pathogene Erbfaktoren bei Hunden. [**Pathogenic Hereditary Factors of the Dog**].—*Z. indust. Abstamm.-u. VererbLehre.* **70.** 503-506. 3 figs.

III. Byerly, T. C., & Olsen, M. W. (1936). **Lethality of Embryo Malpositions in the Domestic Fowl.**—*Poult. Sci.* **15.** 158-162. 1 fig., 2 tables. [13 refs.]

IV. Jull, M. A. (1936). **Adult Mortality from the Viewpoint of Genetics.**—*Ibid.* 195-198. [17 refs.]

I. Five calves sired by a certain bull showed at birth a type of muscle contracture producing rigidity, contraction and even bending of the long bones of the limbs. All the calves died during delivery. The condition was due to a hereditary simple recessive factor inherited from the grandsire. A similar condition has been described in pigs and in sheep.

II. The following anatomical or physiological abnormalities are hereditary :– cryptorchidism ; curvature of the tail in brachyocephalic breeds ; cleavage of mouth structures, *e.g.*, hare lip, cleft palate, etc. ; hypertrophy of vaginal mucosa leading to vaginal prolapse associated with faulty function of the follicular hormone ; faulty oestral cycle ; eczematous dermatitis associated with impaired endocrine function, and decrease in the size of the throat in short-legged breeds.

III. Of fertile eggs which hatch, about 10 per cent. of embryos are misplaced. There is no correlation between such malposition and the probability of the resulting chicks surviving two or more weeks of life, but malposition considerably reduces the likelihood of successful hatching.

IV. Selective breeding of fowls on account of ability to resist specific diseases is impracticable on account of the multiplicity of diseases of economic importance.

Selective breeding should aim at the production of vigorous stock since vigour is an index of ability to resist disease in general.—E. J. Pullinger.

Koch, W. (1936). Neuere Ergebnisse und Stand der Bekämpfung der Zuchtkrankheiten der Haustiere. **[Control of Breeding Diseases of Domestic Animals]**.—*Züchtungskunde*. **10.** 241-255. [4 refs.]

The various causes which interfere with breeding are discussed in general terms. They are classified as exogenous and endogenous. Amongst exogenous causes are those of diet (including minerals and vitamins), poisons and certain infective conditions. Endogenous causes include anatomical and physiological derangements. The method of control of sterility obviously varies with the cause. Dietary irregularities must be corrected and infections should be combated by appropriate hygienic and other measures ; physiological disorders may yield to hormone therapy.

The extent of sterility varies amongst different types of domestic animals. Cattle suffer from most types of sterility ; horses are the most prone to sterility, usually due to physiological causes, rarely to diet. Sterility is uncommon amongst sheep and pigs.—E. J. Pullinger.

Ralston, A. G. (1936). **Some Observations on Sterility in the Mare.**—*J. R. Army vet. Cps.* **7.** 66-77. [6 refs.]

The paper opens with a note on the aetiological aspect of the problem of sterility in mares. The author refers to the three groups into which Dimock and Caslick divided the 335 barren mares examined by them. In his opinion sterility in the majority of cases in these three groups, if traced to its true origin, would be found to arise, not from a single circumstance, but from a complex combination of circumstances, with faulty nutrition as a common factor. This theory is briefly elaborated. The author's views in regard to prophylactic measures are then given. These are based mainly on dietetic and hygienic principles.

The paper then passes to an account of the procedure followed by the author in the routine examination of barren mares. This comprises an enquiry into the history of the case, followed by a clinical examination of the patient. This is an original piece of work of considerable value.

The paper ends with some notes on the treatment of barren mares in which reference is made to the importance of conditioning, the use of anterior pituitary extract, the benefit derived from ovarian massage and the value of irrigation in the control of endometritis.—C. Davenport.

Feiling, O. (1935). Gewinnung und Untersuchung von Samen gesunder und kranker Bullen zum Zwecke der künstlichen Besamung des Rindes. **[Examination of the Semen of Healthy and Diseased Bulls with regard to the Artificial Insemination of Cattle]**.—*Inaug. Diss., Giessen.* pp. 80. 6 figs., 3 tables. [Numerous refs.]

The author reviews the literature at length and gives his results in the collection of semen from bulls using the artificial vagina with live cows, the same with phantoms, and simple collection by rectal massage of the prostate, seminal vesicles and urethra.

The first method was found to be the most advantageous and all samples of semen containing 60,000 or more spermatozoa per c.c. are said to be satisfactory for artificial insemination, though no systematic work was done on this point. Samples containing even a very few trichomonads must not be used for artificial insemination. Trichomonad infection is wide-spread around Giessen and it is

necessary to impose severe restrictions on breeding services for its control; artificial insemination is, therefore, of practical importance locally.—J. E.

HOPKIRK, C. S. M. (1936). **Facial Dermatitis in Sheep in New Zealand: A Photosensitivity of Unpigmented Skin.**—*N. Z. J. Agric.* **52.** 98-103.

A description of photosensitivity of sheep and cattle which appears frequently in certain flush seasons. One type seen in the tussock country of the South Island is considered to be probably due to a native *Hypericum* or an allied plant, while it is more difficult to give a reason for the North Island type seen in rich, luscious green English pastures.

Acute jaundice due to severe damage to bile capillaries, together with acute photosensitivity, are the common lesions. Large numbers of sheep are destroyed because of acute facial lesions and many die later as a result of an atrophy of the liver. It is suggested that phylloerythrin is causative of the photosensitivity, following damage by unknown causes to the liver.

Prevention is carried out by control of pastures and by feeding hay to closely packed flocks so that little chlorophyll is consumed.

I. EULER, H. (1935). Die Bedeutung der Fütterung für die Krankheitsbereitschaft, insbesondere für Zuchtausfallschäden. [**Diet and Disease in Animals**].—*Berl. tierärztl. Wschr.* **51.** 193-196, 209-213 and 225-228. 4 tables. [38 refs.]

II. OPPERMANN, T. (1936). Ueber die Bedeutung des Bodens und der Fütterung für die Entstehung von Haustierkrankheiten. [**Importance of the Soil and Feeding in Relation to Animal Diseases**].—*Dtsch. tierärztl. Wschr.* **44.** 97-101. 3 tables. [12 refs.]

III. HUGHES, J. S. (1936). **Some Deficiency Disorders resulting from Emergency Rations.**—*N. Amer. Vet.* **17.** No. 3. 22-26. 2 figs.

IV. CARLS, H. (1935). Der Phosphorsäuregehalt des Wiesenheues der Grenz- und Neumark und seine Bedeutung für die Tierernährung. [**Phosphoric Acid Content of Pastures of Grenzmark and Neumark, and its Importance for Animal Nutrition**].—*Arch. wiss. prakt. Tierheilk.* **70.** 23-42. 13 tables. [Numerous refs.]

I & II. Valuable reviews, unsuitable for abstract in detail, of available information regarding the influence of diet upon resistance to disease. The chemical constitution of vegetable matter is dependent upon that of the soil and the two factors are intimately linked.

It is known that a healthy animal has considerable resistance to disease and good health is an index of a balanced ration. Apart from the extreme case of sheer starvation, the mechanism by which an ill-balanced diet impairs the natural resistance to disease is not understood. Exceptions are certain mineral and vitamin deficiencies which have been studied extensively. Various hypotheses regarding the effect of ill-balanced diets have been advanced; thus it is suggested that the albumen : globulin ratio of the blood serum is regulated by the diet, and that this ratio is an index of resistance to disease. Such hypotheses lack experimental confirmation.

III. The unavoidable feeding of inferior roughage consisting of dried maize stalks during drought led to vitamin A deficiency disease which was typified by reproductive disorders. Good roughage, *e.g.*, lucerne, contains no vitamin A but an abundance of pigments such as carotene, kryptoxanthine, etc., which are synthesized by the animal body into this vitamin.

IV. The phosphoric acid content of the pastures of these provinces is on

the average 205 mg. per cent. This figure is far above that of a phosphorus-deficient area, and phosphorus deficiency diseases are unknown in these regions. —E. J. Pullinger.

I. Heger, A. (1935). Die Bedeutung von Alkalireserve, Säure-Basen-Gleichgewicht, Binnenregulation (Pufferung), Azidose, Wärmeregulierung für die Verhütung und Entstehung des toxischen Schocks. [**The Significance of Alkali Reserve, Acid-Base Equilibrium, etc., on Shock**].—*Tierärztl. Rdsch.* **41.** 564-570.

II. Krupski, A., Almasy, F., & Osterwalder, H. (1935). Weitere Untersuchungen über das Sauerstoffbindungsvermögen des Blutes gesunder und kranker Pferde und Rinder. [**The Oxidation Reduction Potential of the Blood of Sick and Healthy Horses and Cattle**].—*Dtsch. tierärztl. Wschr.* **43.** 514-518. 3 tables. [9 refs.]

I. A review of available knowledge of the acid-base equilibrium of normal animal tissues. This equilibrium is upset by various factors such as trauma, anaesthesia, etc. Thus general or local narcosis is associated with a rise of the acid and a fall of the alkali reserve. " Shock " is associated with disturbance of this equilibrium. [The article is unsuitable for abstraction].

II. Blood examinations are recorded including haemoglobin content, erythrocyte count and oxygen-carrying capacity per erythrocyte. Normal and diseased horses and cattle were examined. The average oxygen-carrying capacity in normal animals was $2{\cdot}28 \times 10^{-11}$ c.c. oxygen per erythrocyte. In disease this figure varied from $1{\cdot}54 \times 10^{-11}$ (in nephritis) to $2{\cdot}64 \times 10^{-11}$ (in aleucaemic ymphadenosis). [These figures should be accepted with considerable reserve as they were estimated upon extremely small groups of animals and factors which might influence the result, *e.g.*, age, sex, breed, type of work, type of food, etc., were not taken sufficiently into account].—E. J. Pullinger.

Thomsen, O., Engelbreth-Holm, J., & Meyer, A. R. (1935). Erythroblastose bei Hühnern, entstanden während der Immunisierung. [**Erythroblastosis of Fowls**].—*Z. ImmunForsch.* **86.** 500-505.

The inoculation of 12 fowls with blood drawn from apparently normal birds was followed in five instances by an attack of erythroblastosis. In all cases the blood had been refrigerated for 14 days prior to inoculation.—E. J. Pullinger.

Middeldorf, R. (1935). Rachitis, Osteomalazie, Lecksucht und andere Mangelkrankheiten ; ihre Behandlung mit " Ancora-F (R) ". [**Rickets, Osteomalacia, Pica and Other Deficiency Diseases : Treatment with " Ancora-F (R) "**].—*Berl. tierärztl. Wschr.* **52.** 33-36.

The author describes the treatment of several cows, cattle and calves suffering from various disorders such as rickets, osteomalacia, pica and other deficiency diseases, with a preparation which is called " ancora-F (R) ". This is really a mineral mixture in which iodine, sulphur, iron, calcium and phosphorus are included.—James Stewart.

Cordier, G., & Ménager, J. (1935). De la transmission expérimentale de l'ostéoporose chez le porc. [**Experimental Transmission of Osteoporosis in Swine**].—*Bull. Soc. Path. exot.* **28.** 967-981. 7 figs. [10 refs.]

The authors first describe naturally occurring osteoporosis in two herds of swine, only one of which had access to pasture. The first symptoms are difficult movement, lameness and paralysis of the hind quarters, and arching of the back ;

the hocks turn inwards and fill up, the hind feet rest on the median digits and point outwards. The pig later rests on its metatarsals and wasting commences, so that when 12 months old it is half the normal size. Prostration with lateral decubitus supervenes, generally followed by death. The disease runs a course of from one to three months ; in some cases it remains stationary for several weeks and then recovery follows. In the two herds mentioned, during March and the beginning of April mortality reached from 15 to 20 per cent. Fatal results were rare later in the year, when even paralysed sows recovered.

The pathology of the natural condition is described and protocols for all the experimental pigs used are given.

The authors succeeded in effecting five passages of the disease through pigs by means of whole blood, cerebrospinal fluid, filtered blood and spleen pulp obtained from ailing or dead pigs, but were unable to obtain a reaction in guinea pigs, rabbits or donkeys. They obtained cultures of undetermined bacteria from one of the outbreaks of disease which they investigated, but could not transmit an osteoporosis of swine therewith.

From an analysis of a few samples of blood from diseased pigs, a slight decrease in Ca and P levels was noted.

The authors conclude that the disease is infectious and caused by a virus which is present in the blood stream from the time paralytic symptoms appear. The incubation period in experimental cases is about three months, with an evolution varying from two to ten and a half months. They suggest that intermediate transmission, possibly by external parasites (lice), is necessary for a natural spread of the disease. One of the diseased herds was heavily parasitized while the control pigs used in their experimental work failed to contract the disease, although in contact with the infection for about one year. The condition is not affected by antirachitic therapeutics.

The authors outline their further proposed investigations.—C. V. Watkins.

PUBLIC HEALTH.

I. Ehrlich. (1935). Milchüberwachung im Milchwirtschaftsgebiet Niedersachsen. [**Milk Control in Saxony**].—*Dtsch. tierärztl. Wschr.* **43.** 645-650.

II. Rabagliati, D. S. (1935). **The Elimination of Tuberculosis from the Milk Supply.**—*J. State Med.* **43.** 576-586.

III. —. (1936). **Report of Committee on Meat and Milk Hygiene [U.S. Livestock Sanit. Ass.]**—*J. Amer. vet. med. Ass.* **88.** 298-299.

IV. Zeller, H. (1935). Ueber den Nachweis der Dauerpasteurisierung der Milch. [**Pasteurization of Milk**].—*12th Int. vet. Congr. 1934.* **3.** 372-388 [including discussion]. [Numerous refs.] [English, French and Spanish summaries : abst. from orig. in German]. [Also appeared in *Münch. tierärztl. Wschr.* **86.** 193-199].

V. Seelemann. (1936). Bedeutung, Zweck und Durchführung der neuen amtlichen Vorschriften über die Milcherhitzung sowie über die Ueberwachung der Sammelmolkereien. [**Regulations for Heating of Milk as well as for Supervision of Dairies in Prussia**].—*Berl. tierärztl. Wschr.* **52.** 41-45.

I. Discussion of the local regulations and the carrying out of milk control, and a report of the method of examination of bulk milk samples for contamination with tubercle bacilli, *Brucella abortus* and mastitis streptococci.

II. A criticism of guinea pig inoculation as a test for the presence of the

tubercle bacillus in bulk milk samples. Nevertheless the author considers this to be the best test available. Routine clinical examination of dairy cows is also helpful in the eradication of bovine tuberculosis. The Milk (Special Designations) Order (1932) and Attested Herd scheme are surveyed.

III. Cows producing milk for fluid consumption should be subjected to clinical examination and veterinary inspectors should have authority to segregate suspected cows. The veterinary inspecting staff should be under responsible supervision.

IV & V. Discussion of tests for judging adequacy of pasteurization. Even the correlation of several tests only gives approximate results. Consequently all pasteurizing plants should conform structurally with standard requirements and their operation should be subject to official supervision. The changes in the official regulations regarding the pasteurization of milk are surveyed.—E. J. P.

Howell, J. B. (1935). **Bacteriological Examination of Graded Milks.**—*Med. Offr.* **54.** 267. 1 table. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 314. Signed W. G. Savage].

The author submitted samples of the same milk to different laboratories and obtained widely discrepant results. He gives the results obtained from a sample of pasteurized milk divided, with every precaution, into six parts, two samples being submitted to three different laboratories. Results as widely different as 9,270 and 3,400,000 bacteria per cc. were obtained. He ascribes the differences mainly to a failure to carry out accurately the procedure for examination prescribed by the Ministry of Health. He concludes that as the position now stands the results obtained are unreliable and do not warrant penal action, such as the withdrawal of a licence. [The author does not state if the laboratories were of the type dealing mainly with pathological material or those specializing in this and other types of public health work].

I. Miessner, H., & Köser, A. (1935). Dauerausscheider von Fleischvergiftern und ihre Bekämpfung. [**Control of Carriers of Meat Poisoning Organisms**].—*Dtsch. tierärztl. Wschr.* **43.** 561-567. 5 figs., 5 tables. [13 refs.]

II. Francke, G., & Standfuss, R. (1935). Dauerausscheider von Fleischvergiftern und ihre Bekämpfung. [**Control of Carriers of Meat Poisoning Organisms**].—*Ibid.* 721-725. 1 fig., 3 tables. [2 refs.]

III. Miessner, H., & Köser, A. (1935). Dauerausscheider von Fleischvergiftern und ihre Bekämpfung. [**Control of Carriers of Meat Poisoning Organisms**].—*Ibid.* 725-727. 1 table. [2 refs.]

I. Samples of faeces from 1,010 cattle were examined for excretion of salmonella. Twelve animals were identified as permanent excretors. 5 per cent. of 864 blood samples, including the above 12, gave positive serologic reactions. The authors consider that an animal may be regarded as a permanent excretor if a salmonella is isolated at two different examinations carried out at an interval of ten or more days.

II. Having examined 3,200 samples of faeces, the authors conclude that salmonella may for short periods form part of the normal bacterial flora of cattle. Such animals soon cleanse themselves and should only be designated as permanent carriers after three positive results from examinations of faeces have been made at well-spaced intervals. A positive agglutination reaction is evidence of an active focus of infection.

III. The authors consider that the existence of temporary carriers [carrying

salmonella as normal intestinal flora] is problematic. They reiterate their previous statements – see I].—E. J. PULLINGER.

WUNDRAM. (1936). Untersuchungen über die Grosse der Luftkammer von Eiern und die Altersbestimmungen von Eiern in ultraviolettem Licht. [**The Size of the Air Chamber of Eggs and Determination of the Age of the Egg by Ultra-Violet Light**].—*Berl. tierärztl. Wschr.* **52.** 49-51. 1 plate.

Figures are quoted indicating that the air space in eggs stored at a temperature below 15°C. is in no case greater than 5 mm. in diameter in eggs which are less than seven days old. In day-old eggs the air chamber is nearly always of a smaller diameter. The effect of transport upon the size and shape of the air space has now been studied. Varying with the method of packing and the severity of the journey, the air space becomes enlarged and distorted in shape. Changes in the apparent size, as estimated by the use of ultra-violet lamps, are partly due to the gas spreading over a larger area, the depth of the air space being correspondingly decreased. In this case no extra gas has appeared and the increase in size of the air space is illusory. This finding lessens the value of the measurement of the air space as a test of freshness of eggs.—E. J. PULLINGER.

THERAPEUTICS.

PLOTNIKOV, N. N., & ZERTSCHANINOV, L. K. (1935). Fuadin-koncentrat v lečenii opistorchoza. [**"Fouadin" Concentrate in the Treatment of Opisthorchis Infestation**].—*Med. Parasitol., Moscow.* **4.** 299-301. [Copied *verbatim* from *Helminth. Abstr.* **4.** 143. Signed B. G. P.]

In 1 cc. of concentrated fuadin there are 14·3 mg. of trivalent antimony, as against 8·5 mg. in ordinary fuadin. Plotnikov and Zertschaninov have tested the former in three cats and three persons infected with *Opisthorchis felineus.* In the cats there was some reduction of flukes, many being found dead at *post-mortem*, but in man there was only a temporary reduction in the daily egg-output. The drug has definite toxic effects, and the dose effective against *Opisthorchis* is too near the M.L.D. to make it a safe anthelmintic.

SIENCZEWSKI, S. (1935). W sprawie leczenia ciezkiej formy hemoglobinurji (haemoglobinaemia paralytica). [**Treatment of Myohaemoglobinuria Paralytica in the Horse**].—*Przegl. wet.* **48.** 242-245. 1 fig.

Owing to the fact that the actual cause of the disease has not yet been discovered, a great number of medicinal agents have been employed, but no specific has been found. It is advisable, if the horse is unable to stand on its feet, to lift it by mechanical means. The horse must be forced to walk and after half an hour it will usually start to move by itself. The lying down is the cause of complications and of the high percentage of deaths. Slinging the horse is useless.

—K. SZCZUDŁOWSKI (Lwów).

SIENCZEVSKI, S. (1935). L'hémoglobinurie du cheval et son traitement. [**Treatment of Myohaemoglobinuria paralytica in the Horse**].—*Rev. gén. Méd. vét.* **44.** 711-714.

The author refers to his previous communication on the treatment of equine myohaemoglobinuria paralytica by raising and forcibly exercising the affected animal [see previous abst.]. In the present article he stresses the advantages of this procedure and gives details of his method of raising the patient. He con-

siders the disease to be a simple paralysis and not a true paraplegia. He attributes the unfavourable results and mortality associated with the condition to the practice of allowing cases to remain recumbent.—C. DAVENPORT.

I. CECIL, R. L. (1935). **Non-Specific Protein Therapy.**—*J. Amer. med. Ass.* **105.** 1846-1854. [Numerous refs.]

II. HEKTOEN, L. (1935). **The Reactions to the Non-Specific Protein Treatment of Infectious Diseases.**—*Ibid.* 1765-1767. [4 refs.]

III. —. (1936). **Non-Specific Protein Therapy.**—*Lancet.* **230.** 489-490. [6 refs.]

I. Cecil gives a critical survey of the whole field of non-specific protein therapy, as applied to human medicine.

About 20 years ago it was shown that intravenous injections of typhoid vaccine often gave very favourable results in the treatment of typhoid. Soon it was found that similar results could be obtained with *Bact. coli* vaccine, with albumose, or with boiled milk. Non-specific protein therapy dates from these observations.

Many forms of protein and protein-derivative have been tried therapeutically. Those most frequently used are :–

(a) Milk. Ordinary skimmed milk is boiled for five to ten minutes, cooled to body temperature and injected intramuscularly.

(b) Diphtheria antitoxin. This is used as an available form of horse serum and is given intramuscularly.

(c) Vaccines. Ordinary stock or autogenous vaccines are given subcutaneously or intramuscularly unless sharp thermal reactions are required. In this case typhoid vaccine is the most popular and is given intravenously.

There are various commercial preparations available but it seems unlikely that these have any special virtues not inherent in the above.

The reaction to foreign protein injections varies from an almost imperceptible one to extreme shock associated with high fever and profound vasomotor disturbance. Intramuscular and subcutaneous injections excite comparatively mild reactions and there are few patients to whom they cannot safely be given. On the other hand, though such injections do no harm they often do no good. There may only be some local reaction at the point of injection. With large doses there may be a rise in temperature of 1° to 2°F.

With intravenous injections the reactions are more prompt and more marked. At first there is definite chilliness associated with a prompt but evanescent effect on the autonomic nervous system, which gives rise to vascular dilatation and increased activity in the splanchnic area along with contraction of peripheral vessels and decrease of skin activities. This chilliness is followed by a rise in temperature of 3° to 4°F. and a proportional increase in pulse rate. In febrile patients the temperature may rise to 106° or 107°F. and therefore the dose must be carefully watched. Defervescence is usually rapid. Immediately following injection there is a leucopenia and this is followed by a gradually increasing polymorphonuclear leucocytosis reaching its maximum in about six hours. Then follows a gradual return to normal.

Focal reactions – *viz*, a temporary flare-up of acute symptoms in some focus of inflammation – may follow intravenous injections. Almost any inflammatory process, and even an old traumatic injury, may be the site of a focal reaction.

Most writers stress the importance of fever in the protein reaction and certainly the benefit seems to bear some relation to the degree of general reaction and fever. Another important function of the reaction seems to be the mobilization of immune-bodies in the blood stream. Some evidence suggests that in infectious conditions non-specific proteins may stimulate renewed formation of specific

antibodies. The leucocytosis which accompanies the reaction may also have some therapeutic value. In vascular disease it is certain that the degree of vaso-dilatation is of prime importance.

Severe and even fatal reactions have occurred following intravenous injections, but these are rare. There seems to be little risk provided that the treatment is not applied to patients in a state of exhaustion and that the first dose is a small one. It is also wise to avoid treating patients with pulmonary tuberculosis, advanced renal or cardiac disease, or hyperthyroidism.

After 20 years of investigation and clinical trial, non-specific protein therapy has achieved a permanent though limited place in modern therapeutics. Its greatest usefulness seems to be in acute and subacute infections. In chronic disorders its merits are more difficult to assess as many are characterized by natural remissions. It has met with fairly general acceptance in the treatment of the following conditions in human beings :–

(1) A few generalized infections, such as typhoid and sepsis (especially puerperal sepsis); (2) acute and chronic forms of arthritis; (3) inflammatory diseases of the eye, especially acute iritis, uveitis, keratitis and conjunctivitis; (4) certain infections of the skin such as furunculosis, carbuncle and other staphylococcic infections, lupus, persistent forms of urticaria and psoriasis; (5) cutaneous and nervous manifestations of syphilis, and (6) vascular disease such as thrombo-angiitis obliterans.

Favourable results have been claimed in pneumonia, but the treatment is considered to be rather drastic. In the treatment of allergic diseases the results are very conflicting and striking improvements should not be expected.

II. This paper deals in more details with the changes which occur in the organism in response to foreign protein injections.

III. An annotation of I and II.—A. Robertson.

POISONS AND POISONING.

Tsitovich, I. S., & Levinson, M. S. (1935). **The Toxic Properties of Indian Corn infected with Fusarium.**—*Probl. Nutr., Moscow.* **4.** No. 1. 85-97. [In Russian : abst. from English summary]. [Copied *verbatim* from *Nutr. Abstr. Rev.* **5.** 555. Signed A. M. Copping].

Maize infected with Fusarium was toxic for dogs if fed as more than 10–12 per cent. of the ration. Alcoholic extracts of the mouldy corn caused severe symptoms of intoxication if injected into or fed to animals. Pigeons, hens and rabbits appeared to suffer no ill effects from the ingestion of the infected maize.

Allan, H. H. (1936). **St. John's Wort and Allied Species.**—*N.Z. J. Agric.* **52.** 207-213. 6 figs.

A description of *Hypericum* found in New Zealand, either introduced or native. *H. japonicum* is suspected of causing photosensitivity in sheep in certain areas of the South Island.—C. S. M. Hopkirk.

Kohn-Abrest. (1936). Recherches du plomb dans les muscles et la peau des bovidés en état de saturnisme. [**Lead Content of Muscles and Skin of Cattle suffering from Lead Poisoning**].—*Bull. Acad. vét. Fr.* **9.** 122-128.

Analysis of three cows slaughtered in a state of plumbism revealed normal minimal traces of lead in the muscles, but the skins contained between 25 and 40 parts of lead per million, these being of the order found in human beings who had died from lead poisoning.—Alfred Eden.

I. Rader, L. F., Jr., & Hill, W. L. (1935). **Occurrence of Selenium in Natural Phosphates, Superphosphates, and Phosphoric Acid.**—*J. agric. Res.* **51.** 1071-1083. 10 tables. [Numerous refs.]

II. Schneider, H. A. (1935). **Selenium in Nutrition.**—*Science.* **83.** 32-34. [6 refs.]

I. Results are given for selenium in 96 samples of phosphate rock, the range being from <0·1 to 55 p.p.m. The quantity of selenium in superphosphate ranges from <0·8 to 4 p.p.m. and in phosphoric acid is 0·5 p.p.m. or less. The data are discussed from the aspect of the geological type of the deposits. [For the significance of selenium in veterinary science, see references to " alkali disease " – this *Bull.* **6.** 84].

II. The effects of the ingestion of inorganic selenium as distinct from the apparent organic combinations occurring in the natural toxic grain were investigated. Sodium selenite incorporated in the diet at a level of 70 p.p.m. arrested the growth of three-week-old albino rats and caused emaciation and death within two weeks. A level of 35 p.p.m. caused slight and erratic growth, death occurring in about six weeks; 17·5 p.p.m. resulted in slightly abnormal growth and a variation in the lethal effect. Adult rats on a selenium diet at a level of 35 p.p.m. showed the same variability in susceptibility, but withstood the poisoning more effectively than growing rats. The symptoms were identical with those reported for the natural toxic grain.—Ruth Allcroft.

PHYSIOLOGY.

Jung, L., Tagand, R., & Pierre, M. (1935). A propos de l'innervation accélératrice du coeur. **[Research on the Innervation of the Heart].**—*Bull. Soc. Sci. vét. Lyon.* **38.** 33-49. 4 figs., 3 tables. [21 refs.]

Using horses, goats and dogs for their experiments, the authors studied the effects of electrical stimulation (Faradic current) of the distal end of the cervical sympathetic nerve at different levels in the neck and thorax, both before and after cutting the vagus, and also at different levels.

They believe that the accelerator fibres do not run uniformly in the cervical sympathetic nerve but may, in the same species and in the same individuals of a particular species, run in the vagus or be scattered through the common vago-sympathetic trunk (as in dogs).

The thoracic sympathetic fibres are, however, more greatly concerned with the acceleration of the heart action than those in the cervical sympathetic nerve. —J. E.

Papadaniel, S., & Matthaiaki, E. (1936). Souffles cardiaques provoqués chez le cheval par le réflexe oto-cardiaque. **[Cardiac Murmurs in the Horse produced by the Oto-Cardiac Reflex].**—*Ann. Méd. vét.* **81.** 49-55. [4 refs.]

During the last few years the authors have been utilizing an " oto-cardiac " reflex to gain an indication of the state of tonus of the autonomic nervous system of the horse. They claim that the application of a twitch to the right ear causes slowing of the heart in some subjects and acceleration in others. These effects they associate with vagotonicity and sympathetonicity respectively in the subjects concerned. In some cases they found that the reflex gave rise to systolic cardiac murmurs most noticeable at the base of the heart. Acceleration of the heart by exercise or by the administration of atropine failed to reproduce the murmurs, as also did the application of the twitch to the left ear or upper lip. Five cases are

quoted and discussed. The authors consider the sounds to be due to some slight cardiac lesions not observable by ordinary clinical methods, but accentuated by the action of the oto-cardiac reflex.—A. ROBERTSON.

KRILL, H. (1935). Untersuchungen über das Auftreten des Abnutzungspigments in den Ganglienzellen von Hunden unter Berücksichtigung des Alters. [**Pigments found in the Ganglion Cells of Dogs in Relation to Age**].—*Inaug. Diss., Munich.* pp. 23. 21 figs. on 3 plates, 3 tables. [7 refs.]

A review of the literature is followed by the results of an examination of the brains of 15 dogs of various ages, affected with a variety of pathological conditions.

The deposition of lipofuscin was found to increase with advancing age. Certain cells, notably the Purkinje cells and the granule cells of the cerebellum and Ammon's horn, tend to remain free from pigment. Of the cells found to contain lipofuscin, some show the pigment as small granules in the cytoplasm, but in the cells of most of the brain nuclei it is present as large granules. The glia cells usually show no change, except in cases where the ganglion cells show marked lipofuscin deposition, when they contain large fat globules.—E. G. WHITE.

NIELAND, R. (1934). Die Beziehungen der Glaskörpertrübungen zu Alter, Geschlecht, Farbe und Rasse des Pferdes. [**Relation of Opacities of the Vitreous Humour to Age, Sex, Colour and Breed of Horses**].—*Z. Veterinärk.* **46.** 117-135. 10 tables, 5 charts.

The author examined the eyes of 1,860 horses, taken at random, for the presence of opacities in the vitreous humour and, as a result, he has collected a mass of statistical data.

Approximately 30 per cent. of the horses had an opacity and the percentage of affected animals rose directly with age, so that 85 per cent. of horses over five years old were affected. The right eye was affected slightly more frequently than the left, and mares slightly more than male horses. Nearly half of all grey horses examined were affected, but only 28 per cent. of dark-coloured horses showed opacity. The original must be consulted for the details.—W. VON DÜRING (BERLIN).

TUCHLINSKI, K. (1935). Klinische Untersuchungen über Beschaffenheit, Farbe und Veränderung der Iris des Pferdes. [**Condition, Colour and Changes of the Iris of the Horse**].—*Münch. tierärztl. Wschr.* **86.** 601-602.

The eyes of 385 horses were examined and it was noticed that the form and colour of the iris varied slightly with age, but had no connexion with sex or disease.

New-born foals have an almost circular pupil and the iris shows three zones of reddish dark-brown, bluish-grey and dark-brown from inside outwards. At one year old the iris is darker and the middle zone has a greenish tint. After five years the middle zone becomes lighter (brick red). After 15 years dark pigment deposits begin to be laid down.—J. E.

HERBSTREITH, H. (1934). Histologische Untersuchungen an Blutresorptions-lymphknoten von Schweinen. [**Blood Resorption Lymph Glands of Swine**].—*Inaug. Diss., Munich.* pp. 21. 18 figs. [9 refs.]

The presence of haemorrhagic lymph glands in pigs has been considered by some workers to be of diagnostic value in swine fever: others believe this to be the case only when there is no evidence of extravasation of blood in the area drained by the glands. The latter view receives confirmation from the examination by the author of the lymph glands of 60 pigs of all ages and affected with a variety of diseases. It is considered impossible, by macroscopic examination alone, to

differentiate the haemorrhagic lymph glands of swine fever from those engaged in the resorption of extravasated blood. Microscopically, the former are characterized by damage of the blood vessel walls, which is responsible for the haemorrhages.

The course of the red blood corpuscles, transported from the extravasation, is illustrated by diagrams showing their distribution within the lymph sinuses. —E. G. White.

Neseni, R. (1935). Einige anatomische Daten von Pelztieren. [**Some Anatomical Data of Fur Animals**].—*Prag. tierärztl. Arch.* **15.** 211-215. 3 tables.

The author gives the results of his measurements of the lengths of the body and of the alimentary tract of the silver fox, red fox, mink, fitch and nutria. Several sets of figures showing the maxima, minima and averages for many specimens are given in each case: the original should be consulted.—J. E.

Catchpole, H. R., & Lyons, W. R. (1934). **The Gonad-Stimulating Hormone of Pregnant Mares.**—*Amer. J. Anat.* **55.** 167-218. 4 plates, 12 tables. [Numerous refs.]

The authors made a study of the concentration of gonad-stimulating hormone in the tissues of some 60 to 70 mares at all stages of pregnancy from about 21 days to full term. The animals used were wild mustangs and, as no information was available as to breeding dates, the authors were forced to rely on a measurement of crown-rump length of the foetus as an indication of the stage of pregnancy.

It was found that hormone appeared in the blood at a foetal length of 1·9 to 2·5 cm., *i.e.*, about the 40th day, and the maximum concentrations were found when the embryo reached 6 to 14 cm. Activity then diminished and disappeared in all cases after 35 cm. (about 180 days). Hormone was found in the chorion when a foetal length of 1·8 cm. had been reached, but remained relatively low till 6·3 cm. Thereafter it increased till 15 cm. had been reached. Activity rapidly diminished after 21 cm. and finally disappeared at 35 cm.

In the fertile endometrium, hormone appeared at 2 cm. and immediately increased in amount to maximal value at 2·5 to 3 cm. The activity of this tissue was frequently ten or more times that of the most potent plasma. The time of disappearance from endometrium was the same as found for blood. The endometrium of the infertile horn was relatively impotent.

The hypophysis of the mare was active from the earliest stages of pregnancy and remained comparatively constant till 15 to 20 cm. was reached. Activity then diminished and after 35 cm. practically ceased to exist.

Hormone was not found in any appreciable amounts in chorionic fluid or in the foetus.

The authors conclude that the quantitative distribution of the hormone is best explained by a theory of placental (chorionic epithelial cell) secretion of the hormone.—A. Robertson.

Grini, O. (1935). Friedmann-Schneiders drektighetsreaksjon hos hoppen, samt en oversikt over endel anvendte biologiske og bio-kjemiske drektighetsreaksjoner. [**The Friedmann-Schneider Method of Hormonal Diagnosis of Pregnancy in Mares, with a Review of the Subject**].—*Norsk VetTidsskr.* **47.** 397-403, 437-444, 473-484, 535-543 and 615-622. 1 table. [Numerous refs.]

The main part of this article consists of a review of the latest works on gonadotropic hormones with a short description of some of the tests for diagnosis of

pregnancy to which they have given rise. The author's own contribution is a series of tests carried out during the season of 1933 with samples of serum from 38 mares, according to the Friedmann-Schneider method. The experimental rabbits were of different types and ages and, as a rule, only one was employed for each test. The amount of serum injected intravenously ranged from 5 c.c. given once to 15 c.c. given in two or three doses, 10 c.c. being recommended. Laparotomy was performed before injection to ascertain that the ovaries were inactive and was repeated to judge the result. The results were read more clearly at the 72nd hour than at the 24th hour after injection. Of 22 samples taken from 45 to 90 days after the mares had been served, all, except one which was doubtful, gave correct diagnoses, which, in every case, were verified at the time of foaling. Several samples, however, drawn before and after this interval gave faulty reactions. Finally, some improvements of the method are discussed. Some tests carried out according to the biochemic method of Masciotra and Martinez de Hoz are also described.—Gustav Naerland (Oslo).

Fritz, V. (1934). Nachweis der Sexualhormone im Blute als Trächtigkeitsdiagnostikum bei Stuten. **[Hormonal Pregnancy Diagnosis of Mares].**—*Inaug. Diss., Berlin.* pp. 113. 7 tables. [Numerous refs.]

An extensive review of the literature on chemical and biological tests for pregnancy, and a record of original cases in which reliable results were obtained with mares, using blood serum with white mice as test animals.—J. E.

Grant, R. (1934). **Studies on the Physiology of Reproduction in the Ewe. I. The Symptoms, Periodicity, and Duration of Oestrus. II. Changes in the Vagina and Cervix. III. Gross Changes in the Ovaries.**—*Trans. roy. Soc. Edinb.* **58.** 1-47. 6 figs., 2 plates, 10 tables. [Numerous refs.]

I. The data for this part of the investigation were derived from observations on a group of 17 ewes over the period from August, 1931, to May, 1932. The limits of the heat period were determined by observing the mutual behaviour of the ewes and a vasoligated ram. The durations of 63 normal dioestrous cycles and of 77 normal oestrous periods were determined. The mean duration of the cycle was 16·4 days with a range of variation from 15 to 18·5 days. The mean duration of oestrus was 36 hours and the range of variation from 3 to 84 hours. A number of internal and external factors which may affect the dioestrous cycle and the endocrine basis of the cycle are discussed.

II. A description is given of the anatomy and histology of the vagina and cervix of the ewe and of the structural and physiological changes occurring in these organs during the reproduction cycle. The cyclical changes in the vaginal mucosa of the ewe are homologous with those which have been described in rodents; the differences which exist are in intensity and in chronological relationship to the mating period. The author concludes that the technique of the vaginal smear does not give reliable diagnostic findings in the ewe.

III. The gross structure of the ovaries of the ewe is described and an account given of the alterations in structure associated with the several reproductive states. Ovulation occurs spontaneously about the middle of the 36-hour oestral period. During the greater part of anoestrus, follicular maturation and rupture do not occur. In "unflushed" Scottish ewes one or more cycles of follicular maturation, rupture and luteinization occur at the end of anoestrus without heat. It is thought that "flushing" may convert these cycles into full oestrous cycles associated with heat.

Ovarian changes in the ewe are compared with those in other mammals and the dioestrous cycle in the ewe is regarded as equivalent physiologically to the pseudopregnant cycle of the rat.—A. Robertson.

Bravo, D. C. (1935). Alteraciones de la fórmula leucocitaria durante el celo de la perra. [**White Blood Cell Picture in the Bitch during Oestrus**].—*Rev. Hig. Sanid. pecuar.* **25.** 816-821. 2 tables, 3 graphs. [24 refs.]

The author studied the white blood cell picture in the case of a seven-year-old Pomeranian bitch in which oestrus was induced by the injection of 0·4 c.c. of prolan. External signs of oestrus were observed 11 days after injection, this period being considered the prodromal stage.

The principal variation was a lymphocytosis commencing on the third day after injection and continuing during the whole oestral cycle. Slight eosinophilia was observed during the prodromal stage but, after the appearance of external signs, the number of eosinophiles diminished until the end of oestrus, when it returned to normal. The number of neutrophiles oscillated slightly upwards and downwards from normal during the prodromal stage and at the beginning of oestrus. At the end of the cycle and for a few days thereafter a small but constant diminution was observed.

Mononuclear cells also showed only slight variation, but appeared to diminish during the prodromal stage. Basophiles were, as is usual in the bitch, scanty. Arneth's index was not influenced in any way.—Norman Bisset.

Cunningham, Marion M. (1936). **Vitamins in the Diets of Pigs. The Vitamins A and D Content of Whole and Skim Milk, Young Rye-Grass, and Sun-Cured Pasture Hay, with Reference to the Vitamin Requirements of Pigs.** —*N. Z. J. Sci. Tech.* **17.** 673-678. 3 tables. [Numerous refs.]

The vitamin A and D contents of whole and skim milk, young rye-grass and pasture hay were obtained by biological assay. The contents were as follows :–

	Vitamin A.	Vitamin D.
Skim milk ...	Nil.	Nil.
Whole milk...	454 units per pint.	28 units per pint.
Rye-grass ...	35 units per g.	7 units per 100 g.
Pasture hay...	10 units per g.	6 units per 100 g.

The results suggest that there is serious risk of vitamin A deficiency in pigs fed on skim milk without green grass or other foods rich in vitamins.—C. S. M. H.

TECHNIQUE.

Weissberger, A., Young, J. Z., & Carleton, H. M. (1934). **On the Use of Dioxane for Transference of Tissues direct from Water to Paraffin Wax.** —*Lancet.* **227.** 1279-1280. 1 fig. [5 refs.]

Dioxane is a cyclical ether which mixes readily with water, alcohol and molten paraffin, and satisfactorily replaces the usual dehydrating and clearing agents without detriment to the final product. Tissues are transferred direct from fixative to dioxane bath, at the bottom of which a layer of anhydrous calcium chloride or sodium sulphate is protected by zinc gauze. The $CaCl_2$ removes the water from the tissues through the medium of the dioxane, the time required varying from two to 15 hours according to the thickness of the object. A mixture of equal parts of dioxane and wax is used before proceeding to pure wax. With sublimate fixatives, such as Susa's, which give excellent results, a few flakes of iodine in the dioxane will remove the mercury, but potassium bichromate must be washed out of the tissues beforehand. The dioxane vapour is toxic and a tight-fitting stopper is essential for the container.—Norman Hole.

Weiss, H. (1935). Untersuchungen über die Brauchbarkeit des Gömörischen Kalknachweises in der Tierpathologie. [**Usefulness of Gömöri's Method of Demonstrating Calcification of Tissues**].—*Inaug. Diss., Munich.* pp. 24. 6 figs. on 1 plate, 1 table. [9 refs.]

This article is an attempt to assess the value of the method described by Gömöri [(1932). *Virchows Arch.* **286.** 682.] for the demonstration of calcium in histological preparations. The principle of the method is a slow impregnation of the block with silver, in the dark, for several days, followed by removal of the calcium with sulphosalicylic acid.

Advantages claimed for the method are the soft consistency of the silver deposit, rendering cutting easier, and avoidance of the destructive effect of decalcification prior to impregnation. In addition, it is considered that the demonstration of calcium is more specific and complete, especially in the early stages of its deposition.

A study of calcification in tuberculosis, parasitic lesions, blood vessel walls, neoplasms and bone showed the superiority of the method over those of Kossa and of Grandis and Mainini.—E. G. White.

MISCELLANEOUS.

Gerosa, G., & Borrelli, G. (1935). Compendio di semeiotica pei bovini. [**Compendium of Clinical Diagnosis for Cattle**].—*Pubbl. Ist. sieroter. Milano.* pp. vii + 322. 88 figs. [Numerous refs.] Milan : G. Castiglioni. Tipografia " Agraria ". [8vo] [L.20].

This is an elementary text-book for students. The main portion of the monograph is devoted to a description of the methods of examining individual organs and systems, *e.g.*, the skin, digestive and urinary systems, circulation, etc., and the inferences which may be drawn from such examinations. In addition, simple methods for the examination of material for tubercle bacilli, the staining of blood smears, the examination of urine; etc., are described. Finally, diagnostic errors and their causes are briefly discussed.—J. A. Nicholson.

Müller, M. (1936). Die elektrische Betäubung von Schlachttieren. Bemerkungen zu der Stellungnahme der Brüsseler Tierschutzkongresses. [**Electrical Stunning**].—*Tierärztl. Rdsch.* **42.** 47-51.

Müller, M. (1936). Wirkt das elektrische Betäubungsverfahren auch sofort ? [**Rapidity of Action of Electrical Stunning**].—*Ibid.* 210-212. [1 ref.]

Electrical stunning of animals slaughtered for food is advocated on humane and economic grounds.—E. J. Pullinger.

Kossmag, M. (1936). Die Schweineseuche als Gewährmangel. [**Swine Plague as a Cause of Breach of Warranty (Identity of " Swine Plague ")**].—*Tierärztl. Rdsch.* **42.** 163-169.

The author relates a case of conflicting veterinary expert opinion over the death of a pig, the value of which was claimed from the seller by the last owner. Up to the present time, " Schweineseuche " gives grounds for successful action for breach of warranty in Germany, but if it is agreed that it is no genuine disease, then the German laws which refer to it must be amended. [See Vogt & Gunther – this *Bull.* **6.** 466 and 491].

Numerous quotations from text-books and articles on the identity of this disease are given.—J. E.

Tanganyika Territory. (1935). **Measures to bring about Better Distribution of Stock.** [Evans, S. A.].—*Rep. Dep. vet. Sci. Tanganyika, 1934.* pp. 27-32.

The value of animal products in human nutrition is discussed in order to draw attention to the great potential value of the flocks and herds of the country. A sound policy is sought which will help to bring about a better distribution of animals and their products throughout the territory. Soil erosion caused by overstocking in some areas, major contagious diseases of livestock and interference with the traditional native life are only a few of the factors making the whole subject a very complex problem.

Much attention was paid to the marketing of livestock and it was not apparently always easy to reconcile the best interests of the whole country with the local interests of individual districts or tribes. Details follow of livestock trade in the different parts of the country, showing the number and value of animals disposed of in the various markets.

I. Götze, R., Miessner, H., Müller, J., Liess, J., & Hansen, K. (1936). Wünschelrutenversuche an der tierärztlichen Hochschule Hannover. (Regionale Krankheitsdiagnose, Erdstrahlen und Wasseradern in Tierstallungen, Einfluss auf Wachstum und Virulenz von Krankheitserregern). **[Dowsing Trials at Hanover Veterinary College].** pp. 87. 54 figs., 12 tables. [8 refs.] Hanover : M. & H. Schaper. [8vo] [RM. 1.50]. [Also appeared in *Dtsch. tierärztl. Wschr.* **44.** 2-9, 17-25, 33-38 and 49-54].

II. Müller, J. (1936). Wünschelrute und Tierkrankheiten. **[Dowsing and Animal Diseases].**—*Dtsch. tierärztl. Wschr.* **44.** 104-109. 3 figs., 7 tables.

I. Following the reported success of a leading German dowser, Dr Schreiber, in locating the site and severity of the lesion in various human diseases by means of the divining rod, the Reichsgesundheitsamt requested the staff of the Hanover Veterinary College to provide facilities for dowsing trials by Schreiber and another dowser in connexion with animal diseases, location of places in sheds, etc., subject to the alleged malignant action of "earth rays", and the action of these rays on cultures of pathogenic micro-organisms and experimentally infected laboratory animals.

In the first section, the two dowsers examined independently numerous diseased and healthy cattle, which were also examined clinically and with laboratory aids and were then slaughtered and inspected. The various results were then compared.

In the second and third sections, the dowsers set out to indicate places in byres, rooms, etc., which would be dangerous to animals or would result in modifying the virulence of micro-organisms placed there.

The result of the trials showed the dowsers' claims to be groundless in the light of conditions and results determined by the veterinary specialists ; moreover, the results of the two dowsers deviated very widely.

II. A summary of I.—J. E.

---. (1935). **The Journal of the Royal Agricultural Society of England. Vol. 96, including The Farmers' Guide to Agricultural Research.** pp. 8 + 506 + cxlvii. Numerous figs. and tables. [Numerous refs.] London : John Murray. [8vo] [15s.]

By its veterinary and research committees the Society keeps in touch with veterinary matters. It has a long connexion with the Royal Veterinary College, London, and has given considerable support to it ; the principal of the college makes an annual report to the Society on the state of animal diseases in the country. The current year's report appears on pp. 477-481.

Reports are also given of the various research projects supported by the Society : those of veterinary interest include mastitis (pp. 126-128) and eradication of the sheep tick (*Ixodes ricinus*) in Northumberland (pp. 131-132).

There are some general articles on bovine mastitis (pp. 200-204), the immunization of cattle against tuberculosis (pp. 204-213), the incidence of *Mycobact. tuberculosis* and *Brucella abortus* in milk (pp. 214-215), " louping ill " and tick-borne fever in sheep (pp. 215-218) and diseases associated with disturbed mineral metabolism (pp. 218-227). The section on dairy farming includes some information on the anatomy of the udder and composition of milk, on dairy utensils and taints in milk (pp. 283-298).

The consulting chemist gives reports on unsound foodstuffs submitted for analysis : these include unsound linseed cake, ground-nut cake contaminated with castor seed, mouldy bran containing mites, and pollards adulterated with coffee husk.—J. E.

—. (1935). **The Development of the Faculty of Veterinary Science [Sydney].**—*Aust. vet. J.* **11.** 171-185. 1 table, 4 photographs.

In 1935 the Faculty of Veterinary Science at the University of Sydney celebrated its silver jubilee, and an outline of its history is given in this article, together with notes on its staff, benefactors, graduates and undergraduates. Prof. J. D. Stewart, the present dean, has been associated with the school since its inception.—I. Clunies Ross.

Penfold, W. J. (1935). **Medical Research in Australia. [The Bancroft Memorial Lecture].**—*Med. J. Aust.* Nov. 23rd. 707-714. 3 tables.

This is a review of medical research in Australia, but includes a brief mention of unpublished work on beef measles. It has been found that cattle, artificially infected by drenching with *Taenia saginata* eggs, go through a cycle of infestation with beef measles from which they recover, and are then resistant to further infection.—W. I. B. Beveridge.

—. (1935). Journées vétérinaires des 14, 15 et 16 juin 1935. Cinquièmes journées vétérinaires d'Alfort. **[Fifth Veterinary Congress at Alfort, France, June, 1935].**—*Rec. Méd. vét.* **111.** 641-903. 69 figs., 4 tables. [Numerous refs.]

The fifth annual veterinary congress, organized by and held at the Veterinary College, Alfort, is reported fully in the enlarged November issue of the *Rec. Méd. vét.*

A number of papers on scientific subjects were read and practical demonstrations made : these have been separately dealt with in *Index Veterinarius* and in this *Bulletin*.—J. E.

—. (1935). Wissenschaftliche Woche zu Frankfurt a. M., 2-9 September, 1934. **[Scientific Week at Frankfurt, September 2nd to 9th, 1934].** 3 Vols, pp. viii+176, viii+148 and x+248. Leipzig : G. Thieme. [8vo].

At this meeting of scientists three main fields of knowledge were discussed and the contributions were published in book form in corresponding volumes. Volume I was concerned with heredity, volume II with cancer research and volume III with problems of bacteriology, immunity and experimental therapy. The papers of veterinary interest are being dealt with separately.—J. E.

Russeff, C. (1935). Die Organisation des Veterinärwesens in Bulgarien. **[Veterinary Affairs in Bulgaria].**—*Dtsch. tierärztl. Wschr.* **43.** 805-807. 2 figs.

This article repeats some of the information given in a previous one [this *Bull.* **2.** 362]. In addition, brief reference is made to the state veterinary college at Sofia, which was opened in 1923, 400 persons having received training in the interval. There is a veterinary laboratory at Sofia and two others of importance at Weliko-Tirnowo and Stara-Sagora, in the north and south respectively : the author is the director of the one at Weliko-Tirnowo.

[Following a political change at the Ministry of Agriculture, Prof. PAVLOFF (Chief Veterinary Officer) and Dr ANGELOFF (Deputy C.V.O. and director of the central veterinary institute at Sofia) have been forced to resign and have been morally supported by the resignation of most of the higher veterinary officials – *Dtsch. tierärztl. Wschr.* **44.** 39].—J. E.

I. —. (1936). Die Heeres-Veterinärakademie Hannover. [**The Army Veterinary Academy, Hanover, Germany**].—*Dtsch. tierärztl. Wschr.* **44.** 114-162. [Numerous photographs].

II. —. (1936). Einweihung der Heeres-Veterinärakademie in Hannover. [**Opening of the German Army Veterinary Academy, Hanover**].—*Z. Veterinärk.* **48.** 97-105. 2 photographs.

I. Number 8 of the *Dtsch. tierärztl. Wschr.* is a special celebration issue devoted to the new Army Veterinary Academy, and contains a report of the opening ceremony on February 20th, and articles covering the general activities of the Veterinary Corps, including an illustrated account of the New Academy and the daily routine of its students. The Corps now has its own educational academy again after a lapse of 16 years : it is run in close liaison with the Hanover Veterinary College, the teachers of which give assistance in the curriculum. The Director of the Academy is Generalveterinär. Dr FONTAINE.

II. A shorter account of the opening ceremony, etc.—J. E.

I. RATHSMANN. (1936). Das Tätigkeitsgebiet der Veterinäroffiziere. [**The Work of the Army Veterinary Officer (Germany)**].—*Dtsch. tierärztl. Wschr.* **44.** 121-124. 3 photographs.

II. RICHTERS, C. E. (1936). Zweck und Aufgaben des Heeres-Veterinäruntersuchungensamtes. [**Work of the Army Veterinary Research Office**]. —*Ibid.* 126-129. 2 photographs.

III. BERNER. (1936). Wehrkreispferdelazarette und Krankenställe der Wehrmacht. [**Animal Hospitals of the War Defence Department**].—*Ibid.* 135-139. 3 figs.

IV. BARTSCH. (1936). Die Tätigkeit des Veterinäroffiziers im Heereswaffenamt. [**Work of the Veterinary Officer at the Army Equipment Office**].—*Ibid.* 139-140.

V. TAUBITZ. (1936). Das militärveterinäre Berichtswesen. [**The Military Veterinary Report Organization**].—*Ibid.* 142-143.

These are all special articles written for the celebration number of the *Dtsch. tierärztl. Wschr.* to commemorate the opening of the new German Army Veterinary Academy, Hanover.

I. A detailed résumé of the varied activity of the army veterinary officer on general duty with troops, and of things with which he must be familiar.

II. The history of the German Army Veterinary Research Office, from its foundation in 1888 as a small laboratory at Berlin up to the present day, is given. Its latest field of activity is concerned with protection against poison gas.

III. The author gives details of a plan for a large horse hospital, together with ground plans.

IV. During the Great War it became necessary to appoint a veterinary officer to the Army Equipment Office for the purpose of ensuring that equipment for mounted troops was properly made. This is now a permanent post and the occupant has to examine shoeing material, saddles, harness, etc., before it is manufactured in quantity and before delivery to the army.

V. An interesting historical account of the evolution of veterinary reports (diseases and wastages of horses) of the German kingdoms before the foundation of the Reich and afterwards, with critical comments. The plan of composition of reports of the present army was fixed by new regulations in 1932.—J. E.

GHISLENI, P. (1936). Il nuovo ordinamento degli studi di medicina veterinaria. **[The New Veterinary Curriculum in Italy]**.—*Nuovo Ercol.* **41.** 1-5.

A decree relating to higher education in Italy has just been published and, as a result, the Minister for Education, with the assistance of a committee, has drawn up a new veterinary curriculum. The prescribed course extends over a period of four years and every university or other centre conferring a degree in veterinary medicine must adhere to the new syllabus. This is divided into two parts. The 15 subjects in the first part are compulsory and, with the exception of bacteriology, follow closely those laid down for the four years' course of the Royal College of Veterinary Surgeons. The second part of the syllabus contains nine optional subjects which include veterinary jurisprudence, bacteriology and immunology, radiology, etc. A candidate must satisfy the examiners in at least five of these subjects before he can obtain his degree. In addition, it is suggested that, after completing this course, the candidate should extend his knowledge by writing a thesis on some subject connected with veterinary science.—J. A. NICHOLSON.

—. (1935). Planes de estudios en las Escuelas Superiores de Veterinaria. **[The Veterinary High School, Madrid]**.—*An. Esc. sup. Vet. Madrid, 1935.* pp. 9-33. 13 photographs, 11 tables. [Also appeared in *Rev. Hig. Sanid. pecuar.* **25.** 660-699].

A list is given of the staff at the college. According to the government regulations of 1931, the course for a veterinary surgeon is five years. To obtain a doctorate, an additional course of two terms is required. The number of students during the year 1932 to 1933 was 695. A report is given of the surgical, diagnostic and clinical work carried out at the school.

There are 13 photographs of the laboratories and lecture rooms.

MORIN, H. G. S., JACOTOT, H., & GENEVRAY, J. (1934). Les Instituts Pasteur d'Indochine en 1934. **[The Pasteur Institutes of Indo-China during 1934]**. —*Arch. Inst. Pasteur Indo-Chine.* No. 20. pp. 427-647. 34 plates, 3 tables, 7 charts.

This is a special number in celebration of the tenth year of publication of the journal ; it gives a history, with numerous photographs, of the Pasteur Institutes set up in Indo-China, and a complete index of the articles published during the last ten years (pp. 520-567).

There are institutes at Saigon, Nhatrang, Hanoi, and Dalat. The first named was established in 1889, and here D'HÉRELLE and LE LOUET did their work on bovine haemorrhagic septicaemia, and BROUDIN his on fowl cholera. It was at Nhatrang that YERSIN studied rinderpest and produced his anti-rinderpest serum. A full description of the preparation of the serum is given. At Nhatrang also the study of antirabic vaccination of dogs has recently been undertaken and at Hanoi in Tonkin, where the rabies virus encountered has an extremely short incubation

period in man (an average of only 26 days), a special antirabic treatment has been evolved. The institute at Hanoi specializes in hygiene, and that at Dalat in the manufacture of biological products.

It was CALMETTE who founded the institute at Saigon, and YERSIN who established that at Nhatrang which specializes in the study of animal diseases. At these institutes a profound study has been made of rinderpest and surra.

The index contains references to a large number of papers published in the *Archives* from 1922 to 1934 on rinderpest, bovine tuberculosis, bovine infectious anaemia, foot and mouth disease, sheep pox, rabies and trypanosomiasis.

—F. BULLOCK.

POLIKARPOFF, G. F. (1935). Kak organizovat takticheskie zanjatija po veterinarnoj sluzbe. [**The Organization of the Veterinary Services, U.S.S.R.**]—*Sovyet. Vet.* No. 2. pp. 13-17.

The greater part of this report is devoted to a discussion on the organization of the training of veterinarians for military work.

[This article deals with conditions evidently quite different from those in other countries as the veterinary staff referred to appear to be untrained. Emphasis is laid on the necessity for army veterinary officers to accompany troops in the field and to be given full information concerning the military organization of the force – this being necessary because at present their training is limited to theoretical instruction.—Ed.]

KOLPAKOW, V. N. (1935). Ueber Kamelkreuzungen. [**Camel Breeding in the Union of Socialist Soviet Republics**].– *Berl. tierärztl. Wschr.* **51.** 617-622. 18 figs. [Numerous refs.]

This article commences with a review of some of the literature dealing with the anatomy and crossing of camels. This is followed by a description of the main types of pure-bred camels used in the U.S.S.R.

The main part of the paper deals with the matings used to produce hybrids which are good baggage animals and which also possess good powers of endurance. Commencing with *Camelus bactrianus* and *C. dromedarius* as parents, a breeding table is given showing the result of this mating and subsequent matings, either hybrid with pure-stock, or hybrid with hybrid. A descriptive account is given of each type produced and the good and bad points are stressed. It was found that the best hybrids were (1) Bertuar (cross obtained by mating *C. bactrianus* and *C. dromedarius*), and (2) Kospak (result of mating *C. bactrianus* - male – with Bertuar - female). The mating of hybrids, *i.e.*, Bertuar with Bertuar, etc., always gave very unsatisfactory progeny which were weak, badly conformed, difficult to train, etc. The author stresses the importance of careful selection of animals to be used for breeding and also considers it very important that the animals should receive every attention during the summer months so that a good growth of hair is assured for the winter.

The paper is illustrated with photographs of most of the types mentioned in the article.—G. DODS MUNRO.

GRAHAM, R., & MICHAEL, Viola M. (1936). **Studies on Incubator Hygiene V. A Note on the Hatchability of Eggs inoculated with Salmonella, Pasteurella, Staphylococci and Streptococci.**—*Poult. Sci.* **15.** 83-87. 5 tables. [For abst. of previous article of this series, see this *Bull.* **6.** 594].

Since *S. pullorum* has frequently been considered to be the cause of low

fertility and hatchability of eggs, experiments were carried out to show whether other micro-organisms which have been isolated from eggs or oviducts have a similar injurious effect upon hatchability of eggs.

When eggs were inoculated with 3 c.mm. of a 0·85 per cent. sodium chloride suspension of *S. pullorum*, *S. typhi-murium*, *S. gallinarum*, *P. aviseptica* and two strains of staphylococci there was a very definite decrease in the hatchability. The hatchability of eggs was only slightly impaired by inoculation with three strains of streptococci.

Inoculations with 0·85 per cent. sterile NaCl, and a suspension of micro-organisms in 0·85 per cent. NaCl, made by puncturing the side of the egg, appeared to have a more detrimental effect upon the hatchability than the same material injected into the air cell.—R. F. Gordon.

OFFICIAL AND OTHER REPORTS.

Uganda Protectorate. (1935). **Annual Report of the Veterinary Department for the Year ended 31st December, 1934.** [Poulton, W. F.] pp. 36. 18 tables, 1 chart, 2 maps. Entebbe: Govt. Printer. [fcp] [3s.]

This report is divided into sections dealing with disease control, glossina investigations, research, education, animal husbandry, hides and skins, ghee and butter, and meat and milk supplies.

Disease Control.

Rinderpest.—It is reported that nine outbreaks occurred during the year, of which eight were suppressed. The majority of the outbreaks were due to contact with infected game. One outbreak occurred 150 miles from the nearest known infected centre, the source of infection not being determined.

Local outbreaks were dealt with by segregation and immunization of in-contacts by double inoculation with serum and virulent blood, 22,865 animals being inoculated. In spite of outbreaks of the disease on the trade routes, trade movements were continued under the protection of serum without further spread of disease resulting.

Trypanosomiasis.—It is thought that this disease will continue to cause grave loss until cattle owners prevent the introduction into their herds of any animals whose history they do not know. The control of trypanosomiasis is not easy, as the slaughter of infected animals is impracticable in view of the large numbers of animals involved. The administration of tartar emetic requires an expert staff, but promising results have been obtained with "surfen C" in infection with *Tryp. congolense* and the value of this drug is to be accurately tested.

Ninety-one outbreaks of trypanosomiasis occurred during the year, the organisms involved being *Tryp. vivax*, *Tryp. congolense*, *Tryp. brucei* and *Tryp. theileri*.

Anthrax.—Outbreaks are said to occur whenever it is necessary to concentrate cattle for immunization against rinderpest, and owners are often careless in control during, or shortly after, a rinderpest outbreak. The disease occurs in a sporadic form throughout the western districts, and one outbreak is recorded which resulted in the deaths of 60 cattle and two human beings. It is suggested that large-scale immunization of cattle may become necessary.

Tuberculosis was encountered mainly at abattoirs, the long-horned western cattle exhibiting an infection rate of 34 per cent. whilst the zebu cattle of the eastern

areas only showed an infection rate of 2·4 per cent. The detection of tuberculous infection in sheep and goats with a bacillus of the bovine type is recorded.

Foot and Mouth Disease was reported from four districts, but is described as mild, easily controlled and of little economic importance.

Other Diseases.—Blackleg, tick-borne diseases, and contagious ophthalmia of cattle came under observation, whilst outbreaks of fowl pox, fowl typhoid and coccidiosis of turkeys were encountered in poultry.

Glossina Investigation.

This section of the report records further work on tsetse control by systematic grass-burning and the fumigation of vehicles passing through " fly " areas. Cattle have been reintroduced into some of the cleared areas, with apparent success.

Education.

The work consisted of the training of native veterinary assistants, lectures on animal management given on the government stock-farms, and courses in meat inspection.

Animal Husbandry.

The castration of 80,000 animals is recorded, the training of pack oxen for transport, the investigation of the potentialities of native stock, and the organization of milk and meat supplies for townships.

In two townships the meat considered unfit for human consumption, mainly on account of tuberculosis or infection with *Cysticercus bovis*, is condemned and either destroyed or boiled for two hours. At native markets there is no power authorizing condemnations but arrangements have been made that meat of an inferior quality shall be sold in a special part of the market.

The report closes with some general remarks and notes on the amount of revenue derived from departmental activities. There are two appendixes to the main report, the report of the veterinary pathologist and a special report on tuberculosis research, which are abstracted elsewhere in this *Bulletin*.—U. F. R.

Uganda Protectorate. (1935). **Annual Report of the Veterinary Pathologist, Entebbe, for the Year 1934.** [Mettam, R. W. M.]—*Rep. vet. Dep. Uganda, 1934.* pp. 21-30. 4 tables, 1 chart.

This report, in addition to routine examination of specimens, collection of parasites and the manufacture of laboratory products, deals with research work on rinderpest, trypanosomiasis, theileriasis, " turning sickness ", tuberculosis, ancylostomiasis of dogs and contagious pleuro-pneumonia of goats.

Rinderpest.—Immunity tests were carried out in February and March, 1934, on cattle which had been vaccinated in 1932 and 1933. One temperature reaction and two reactions with definite rinderpest symptoms and death occurred out of 13 cattle tested.

Experiments on the susceptibility of goats and sheep indicated that both these species of animal could be inoculated with the local rinderpest virus, and that no marked reduction in virulence occurred after six goat passages. The disease in goats varied from a temperature reaction to severe disease and death. These animals were shown to contract rinderpest by contact with infected cattle and to be capable of transmitting the disease to clean cattle by contact.

The rinderpest virus was found to appear in the blood and spleen of cattle within 24 hours of inoculation, but did not appear in the brain till 96 hours after inoculation. Attempts to propagate the virus in the brains of mice were unsuccessful.

Attempts to manufacture a concentrated anti-rinderpest serum by precipitating the total proteins gave satisfactory results, but were abandoned owing to the absence of appropriate plant.

Trypanosomiasis.—Observations were continued on the susceptibility of game to trypanosome infections. An oribi was proved to be infected 62 days after inoculation with *Tryp. congolense*, but appeared to be free from infection on the 140th day. A further examination of outbreaks of *Tryp. congolense* infection in Buvuma, where it was thought that *Glossina palpalis* might be the transmitting agent, revealed the presence of *G. pallidipes*. Further observation on cattle which survived infections with *Tryp. rhodesiense* and *Tryp. brucei* showed that, after an initial period of disease, gradual recovery occurred with a final complete recovery from the infection. Nineteen cattle were inoculated with *Tryp. congolense* and treated later by the intramuscular injection of 100 c.c. of " surfen C ". One animal died, but the others appeared to make a complete recovery, and four proved sterile to a subinoculation test carried out three months later. The drug proved equally useful in two cases of *Tryp. brucei* infection, and also appeared to have a prophylactic value against *Tryp. congolense*.

Theileriasis.—Further observations are recorded on " turning sickness ", and it is stated that " acaprin " proved ineffective in the treatment of East Coast fever.

Tuberculosis.—A local human strain of the bacillus failed to produce more than a focal lesion in cattle, whilst local bovine strains produced severe progressive tuberculosis. Other observations on this subject are contained in a special report.

Bovine Contagious Abortion.—A herd of 80 cows submitted to the agglutination test gave 21 positive reactions ; it is noted that positive reactions to this test have also been given by human beings in Uganda.

Diseases of Dogs.—Eleven out of 18 dogs examined for ancylostomiasis were found to be passing ancylostome eggs. Carbon tetrachloride proved efficacious in treatment. Six cases of canine tick fever were treated satisfactorily by the administration of " acaprin " intravenously.

Caprine Contagious Pleuro-Pneumonia.—This disease proved difficult to transmit, intratracheal inoculations of small quantities of lung extract proving the most reliable method. Filtrates of lung extract gave negative results, but in view of the difficulty in transmission and the small number of animals used, this cannot be considered as conclusive evidence that the infective agent is not a filter-passer.

—U. F. Richardson.

Tanganyika Territory. (1935). **Annual Report of the Department of Veterinary Science and Animal Husbandry, 1934.** [Hornby, H. E.] pp. 130. 26 figs., 7 plates, 60 tables, 2 graphs. Dar es Salaam : Govt. Printer. [fcp] [5s.]

The report is submitted under the following six main headings :– Part I – Staff and General ; Part II – Disease Control ; Part III – Measures to bring about Better Distribution of Stock ; Part IV – Hides and Skins ; Part V – Research ; Part VI – Demonstration Farms.

Staff and General.

The work of the department has become so varied that it was deemed advisable to define clearly its policy, and this is outlined in detail on pp. 3-5.

Finance.

The expenditure of the department amounted to £40,694 and revenue derived from various sources, including the value of biological products issued free for the benefit of the natives, amounted to £13,331.

Each of the sections is dealt with separately in this *Bulletin*.—S. A. Evans.

NIGERIA. (1935). **Report of the Tsetse Investigation.** [LESTER, H. M. O.] —*Rep. med. Dep. Nigeria, 1934.* Appendix B. pp. 69-88. 3 tables.

Owing to economy measures the Assistant Veterinary Pathologist reverted to the Veterinary Department in November. Reference is made to treatment of cattle for *Tryp. vivax*, *Tryp. congolense*, and mixed infections with these parasites. Omitting consideration of the cost of treatment, a single dose of " surfen C " is said to be equivalent in value to three weekly doses of tartar emetic, while three doses of " surfen C " are thought to be superior to the usual course of tartar emetic. The value of the experiments was affected by heavy losses from rinderpest. Nine animals recovered from *Tryp. vivax* and *Tryp. congolense* infections became reinfected when exposed to natural infection. Twenty-three cattle, recovered from *Tryp. vivax* infection, resisted reinfection for the first month under observation, but ten controls all became infected in 11 days. Distilled water should be used for dissolving " tryparsamide ", since natural waters may contain impurities, not removed by boiling and filtering, which cause changes in the drug and adverse symptoms.—J. A. GRIFFITHS.

MAURITIUS, COLONY OF. (1935). **Annual Report of the Veterinary Division [for 1934].** [LIONNET, F. E.]—*Rep. Dep. Agric. Mauritius, 1934.* pp. 23-24. 1 table. Port Louis : Govt. Printer. [8vo].

The government veterinary surgeon was on leave for most of the year.

Tryp. evansi was observed in blood smears from 24 animals and *Tryp. vivax* in eight animals. An outbreak of piroplasmosis was effectively controlled by the use of trypan blue. Twenty-two positive reactions were obtained in tuberculin tests of 611 cattle and BCG was used extensively. A few outbreaks of fowl cholera occurred.—J. E.

INDIA, CENTRAL PROVINCES AND BERAR. (1936). **Annual Report on the Working of the Civil Veterinary Department for the Year ending 31st March, 1935.** [SHANKER, G.] pp. 24. 8 tables, 4 appendixes. Nagpur : Govt. Printing C.P. [8vo] [Re.1].

The staff consisted of the director, a deputy director, an investigation officer, four assistant directors, 13 veterinary inspectors and 131 veterinary assistant surgeons. The death of Major R. F. STIRLING, who was in charge of the department throughout the year, is recorded by the Government with deep regret, and high testimony is paid to his work.

Contagious disease was less than for the previous two years. Rinderpest was responsible for the heaviest mortality, but there was a remarkable fall in the number of outbreaks. Goat virus inoculation against rinderpest was further perfected and used more extensively. Trypan blue was used extensively in bovine piroplasmosis, with good results.

The number of cases treated on tour and the number of castrations performed increased satisfactorily.

A new dispensary was opened, making a total of 104, and the work at all the dispensaries showed good results.

The Cattle Diseases Act became law during the year and is expected to be brought into force in the near future.—G. K. WALKER.

I. AUSTRIA. (1935). Compte rendu de la section de diagnostics de l'Institut Fédéral de Mödling pour la prophylaxie des maladies épizootiques pendant l'année 1933. [**Work of the Diagnostic Department of the Federal Animal**

Diseases Laboratory, Mödling, during 1933].—*Bull. Off. internat. Epiz.* **11.** 219-221. [1 ref.]

II. Austria. (1935). Compte rendu de la section de diagnostics de l'Institut Fédéral de Mödling pour la prophylaxie des maladies épizootiques pendant l'année 1934. [**Work of the Diagnostic Department of the Federal Animal Diseases Laboratory, Mödling, during 1934**].—*Ibid.* 221-222. [1 ref.]

I. Anthrax was diagnosed in 57 bovines and eight pigs.

Tuberculosis.—Of 92 cases examined 68 proved positive.

Glanders.—Of three outbreaks investigated, one was proved to be glanders.

Haemorrhagic Septicaemia.—Of two cases examined, one was positive.

Contagious Abortion of Cattle was determined bacteriologically in 73 out of 212 cases and serologically in 1,130 out of 4,642 cases examined. *Vibrio foetus* was found five times.

Fowl Cholera was determined in 199 out of 368 examinations made.

Blackleg.—Material from 503 suspected cases was examined; of these, 354 were proved to be blackleg.

Diseases of Swine.—2,097 cases of infectious disease were examined; 447 cases of swine fever, 173 of swine erysipelas and 23 of swine plague were diagnosed.

Rabies.—Negri bodies were found in 41 cases and four cases were determined by animal inoculation tests. Ninety-three persons were bitten by various animals, 14 of which were proved to be affected with rabies.

II. Much of the material is similar to that dealt with in the previous year's report.

Anthrax.—This disease was determined in material from 84 cattle, 2 horses, 4 pigs, 1 dog and 1 duck.

Rabies.—This disease was much less prevalent. Out of a total of 141 cases examined, Negri bodies were found in suspected material from 11 cases and the disease was determined in only one other case by animal inoculation tests.

Very similar figures are given for all other examinations made, except for glanders, which was not diagnosed during the year.—C. V. Watkins.

Holland. (1935). Verslag van den veterinair hoofdinspecteur van de volksgezondheid, in het bijzonder belast met het toezicht op de naleving van de vleeschkeuringswet, staatsblad 1919, No. 524, over het jaar 1934. [**Report of the Veterinary Inspector for Public Health and Meat Inspection for 1934**]. [Berger, H. C. L. E.] pp. 62. 14 tables. The Hague: Meded. Volksgezondheid. [8vo].

There was a decrease in the numbers of cattle and sheep slaughtered for food in Holland, while the number of new-born calves slaughtered showed a marked increase (due to the national policy of decreasing the cattle population). The number of cases of cysticercosis in cattle increased from 0·83 per cent. in 1933 to 0·92 per cent. Echinococcosis in cows, heifers and sheep diminished by 0·59, 0·014 and 0·37 per cent. respectively. The percentage of tuberculosis in cattle, which had decreased from 21·21 in 1931 and 18·3 in 1932 to 17·14 per cent. in 1933, rose again in 1934 to 18·29. The percentage of tuberculosis in pigs during the years 1931 to 1934 continued to rise respectively from 4·61, 4·79 and 5·17 to 5·4 per cent.—M. J. J. Houthuis (Rotterdam).

Sweden. (1935). Det civila veterinärväsendet år 1934. [**Report of the Civil Veterinary Department for 1934**]. [Höjer, J. A.] pp. v + 45. 32 tables. Stockholm: Kungl. Boktryckeriet. P.A. Norstedt & Söner. [8vo] [French summary: abst. from orig.]

In 1934 the number of veterinarians in Sweden was 601 of which 62 were inactive. 251 were district veterinary surgeons, 130 were in charge of abattoirs, 32 were meat inspectors of material intended for export, 26 were provincial veterinary officials, 15 were engaged in the civil veterinary administration, 17 were town veterinarians, 17 were teachers, 29 held army commissions and 124 were in private practice. From January 1st, 1934, onward all " district veterinary surgeons" became government officials.

Diseases of Animals.

Anthrax.—The incidence was almost as in previous years, 91 deaths being reported.

Bovine Tuberculosis.—207,705 cattle in 10,039 herds were tested with tuberculin, the reaction being negative in 3,240 herds. Out of 31,100 cattle more than two years old, 5,600 between one and two years old, and 5,100 calves, tested with tuberculin for the first time, 16·5, 14·7 and 6·5 per cent. respectively gave positive reactions. Control tests on 104,600, 2,500 and 24,200 head of cattle in similar age groups, but in herds in which general control measures were in operation, showed an infection incidence of 3·1, 1·9, and 1·4 per cent. respectively. In a table there is a survey of the results of tuberculin tests in Sweden from 1897 to 1934. In 1934, 172 cows were slaughtered on account of udder infection, 95 on account of tuberculosis of the genital organs, and 899 on account of open tuberculosis of other organs.

Brucella abortus Infection.—About 1,600 herds with approximately 7,900 animals were infected.

Blackleg caused the death of 25 head of cattle.

Foot and Mouth Disease and Swine Fever.—No cases were reported.

Equine Infectious Anaemia was diagnosed in 674 cases and 366 horses were slaughtered. From October, 1934, all affected horses in Norrbotten province were slaughtered. The campaign against the disease is carried on by a special commission. Liver puncture in diagnosis is widely used.

Food Control.

There are eight public abattoirs in the largest towns of Sweden. In addition there are 114 communal meat inspection centres, and 33 export abattoirs. Statistics are given.—H. Berthelsen (Stockholm).

Ochoa, F. (1934). Las labores desarrolladas en la Escuela Nacional de Medicina Veterinaria, durante los ultimos cuatro años. [**Four Years' Work in the Veterinary School of Bogotá**].—*Rev. Med. vet. Bogotá.* **6.** 957-984. 20 figs.

The author details the four years' period of training, changes in the syllabus, erection of new buildings, and installation of laboratories and diverse services. In particular, he specifies the work carried out in the infectious diseases laboratory in connexion with the diagnosis and prevention of *Salmonella gallinarum* infection and a bovine salmonella infection spoken of as " peste boba ". It is believed that an autogenous vaccine gives good results.

The article contains photographs of out-buildings and of certain pathological specimens. Statistics of services and laboratory diagnoses are given.

—J. Vidal Munné (Barcelona).

United States of America. (1935). **Report of the New York State Veterinary College at Cornell University for the Year 1933-1934.** [Hagan, W. A.] pp. 152. 1 fig., 21 tables. [Numerous refs.] Albany : J. B. Lyon Company. [8vo].

174 students were enrolled during the year and 44 graduated. By a system

of selective admission the average educational level is being raised, but the four years' course is now recognized as too short, though no step has been taken to lengthen it. It is noteworthy that Cornell Veterinary College has a large panel of external teachers, about half of whom are practitioners ; another point of interest is the large extent to which members of the staff lecture to farmers' clubs, etc., and give radio talks on technical matters.

Statistical reports of the work of the Ambulatory, Small Animal and Surgical Clinics and the poultry laboratories at Ithaca and Farmingdale, L. I., are given in tables. Most of the report is devoted to scientific articles, all of which have been published elsewhere and are dealt with in this *Bulletin* as they appear.—J. E.

GREAT BRITAIN. (1935). **The Lister Institute of Preventive Medicine. Report of the Governing Body, 1935.** pp. 24. [4to].

VIRUS DISEASES.—Dr EAGLES continued his research on the cultivation of vaccinia virus on cell-free medium ; success was obtained in some series, but not in others. Dr HURST studied equine encephalomyelitis in monkeys and guinea pigs. Rapid increase in the virus was obtained, apparently by growth in the blood. Brain infection is effected by the blood stream. The agent responsible for tumour formation in avian sarcoma was shown by LEDINGHAM and GYE to be contained in cell-free filtrates. Dr KLEINBERGER continued her studies on the organism of contagious bovine pleuro-pneumonia : similar organisms have been seen in cultures of certain streptobacilli. Dr FINLAYSON finished his work on the use of elementary bodies in the complement-fixation test for vaccinia. Dr SABIN obtained interesting results in a study of the interaction of neutralizing bodies in immune serum and homologous virus (vaccinia, the virus of Aujeszky's disease and B virus). Tests with high-speed centrifugalization showed that antibody and virus did not combine.

SEROLOGICAL STUDIES.—Dr YUSEF developed a precipitin test for differentiating members of the pasteurella group. Work on antibacterial immunity against *Clostridium septique* in laboratory animals gave encouraging results, but it is stated that they are not necessarily applicable to other animals, *e.g.* sheep. Dr BARRATT and Dr CARNE worked on human and animal strains of corynebacteria, it being found that *C. ovis* differs distinctly in cultural and pathogenic characters from *C. ulcerans*. The first results of immunization studies with *C. ovis* were poor, but the work is continuing. Dr BARRATT also found that nine of 36 strains of *Brucella abortus* from milk grew without CO_2 in the first culture.

Results of work with the " Vi " antigen of *Salmonella typhi* are recorded. Dr SCHÜTZE and Dr GORER continued work on the resistance to infection of selected and inbred strains of mice.

The present trend of research methods on the physical nature of ultramicroscopic particles is described. The ultra-high-speed centrifuge of Prof. SVEDBERG of Uppsala plays an important part in this work.

ENDOCRINOLOGY.—Work on the male hormone androsterone, on oestrin and on pituitary hormone is described.

Dr ELLINGER investigated kidney function by a method of direct photography of living tissue.

Notes are given on the progress in international standardization of vitamins as agreed at the second International Conference on Vitamin Standardization held in London in June, 1934.

NATIONAL COLLECTION OF TYPE CULTURES.—200 new strains were added. [A new catalogue has just been issued].—J. E.

INDIA. (1934). **Annual Report of the Director of the Pasteur Institute of Southern India, Coonoor, for the Year ending 31st December, 1934, together with the Twenty-Eighth Annual Report of the Central Committee of the Association for the Year ending 31st March, 1935.** [IYENGAR, K. R. K.] pp. 76. 49 tables. Madras: Madras Publishing House Ltd. [8vo].

Over 20 litres of antirabic vaccine were issued to veterinary surgeons during the year; 259 animals, including 216 dogs, were treated after being bitten. One mongoose brain was found to be positive for rabies.

Amongst the numerous statistical tables concerning human patients is one showing the animals which bit, scratched or licked the patients; these include 20 species.—J. E.

I. INDO-CHINA. (1935). Rapport sur le fonctionnement de l'Institut Pasteur de Nhatrang en 1934. [**Report on the Work of the Pasteur Institute, Nhatrang, Indo-China, in 1934**]. [JACOTOT, H.]—*Bull. écon., Indochine.* **38.** 799-806. [6 refs.]

II. INDO-CHINA. (1935). Fonctionnement des Instituts Pasteur d'Indochine en 1934. [**The Work of the Pasteur Institutes in Indo-China during 1934**]. —*Arch. Inst. Pasteur Indo-Chine.* **6.** 179-181. 1 table.

I. Of the three Pasteur Institutes in French Indo-China, that of Nhatrang alone is concerned with animal disease.

ROUTINE WORK.—Large quantities of vaccine and/or antiserum were prepared for use against rinderpest, rabies, barbone, anthrax, blackleg and fowl cholera. 43,000 doses of rinderpest vaccine were destroyed because, owing to the economic depression, they were unsold. 11,000 doses of a formolized antirabic vaccine were issued, a large-scale dog vaccination plan having just been adopted in the country.

RESEARCH.—A résumé of the results of ten years' work on anti-rinderpest vaccine is given. In the order of their antigenic value the following tissues are useful:– thyroid glands, lymph nodes, thymus, spleen and lungs; lymph nodes are twice as potent as spleen and four times as potent as lung tissue. Liver and testicle are useless for vaccine production; they even appear to reduce the value of good tissue vaccines when mixed with them. 0·2 g. of lymph node suffices to form a good immunizing dose for a calf. Age weakens a vaccine, so that a triple and sextuple dose of three and six-month-old vaccine respectively are necessary. Toluene and sodium fluoride are better than formalin, chloroform or phenol as preservatives and their exact concentration and the amount of water vehicle do not matter for the antigenic potency of the vaccine. Dehydrated spleen pulp retains its potency better than a fluid suspension, being still 50 per cent. active after six months at 30°C.

Research on bovine malignant catarrh in French Indo-China has failed to elucidate its nature.

II. Contains a few tables and notes on the routine work only.—J. E.

BOOK REVIEWS.

HALL, M. C. (1936). **Control of Animal Parasites. General Principles and their Application.** pp. 162. 26 figs. Evanston, Illinois: The North American Veterinarian. [8vo] [$2].

In the collection of papers, here presented in book form, Hall develops his idea that the control of disease and, in particular, of disease caused by animal

parasites, is a wide study, sufficiently complex to justify its treatment as a separate science, in the same way as pathology and epidemiology are treated as separate sciences.

There is certainly something to be said for this approach, and anyone reading through the lists of measures recommended for the control of the various parasites, as given in many publications on parasitology, must feel the force of the suggestion that something might be done to assist in the evaluation of the measures which are available in any particular instance. The statement of control measures, their comparison and assessment could, no doubt, be made in several ways; mathematical treatment of the subject might, presumably, have thrown some new light on the probabilities of success from the use of some measures, and the comparative futility of others – Hall, however, has gone to one of the least expected quarters in turning to military science for the exposition of his subject.

And this is the second of Hall's fertile ideas which the book presents – that the principles of the control of or "warfare" on parasites resemble those of human warfare, and that the science of tactics and strategy as studied by military men for thousands of years is often directly applicable to the war on parasites. This new idea is most ably developed. It clearly illustrates the first idea that parasite control is worthy of treatment as a separate science, stimulates interest in the subject, encourages clear thinking, and assists in the estimation of our strength or weakness in any given situation. The main part of the book deals with the application of the principles to particular control problems, but the early chapters are, perhaps, the best and most interesting; in these the various disease situations and methods of parasite control are considered under such headings as "Tactics and Strategy of Warfare on Parasites", "The Nature of the War on Parasites", "Enemy Forces", "Organization of Our Forces", "Structure of Tactical Problems" and "Problems of Attack and Principles of Offensive Combat", throwing a new and clear light on the relative value of the various methods of parasite control.

The casual reader may not regard this book in a very serious light, although he would be certain to find it interesting and amusing, but Hall is quite serious, and his thesis is worthy of the careful consideration of all who are concerned with the control of animal disease.—E. L. TAYLOR.

MERILLAT, L. A., & CAMPBELL, D. M. (1935). **Veterinary Military History of the United States, with a Brief Record of the Development of Veterinary Education, Practice, Organization, and Legislation.** 2 Vols. pp. 1,172. Numerous photographs. [Numerous refs.] Chicago: Veterinary Magazine Corp. [8vo] [$10].

The authors have attempted to write the history of the American Army Veterinary Service and at the same time the history of the profession in America. Running through this double story are continually recurring comments on the unpreparedness of the veterinary service in time of war, and on the repeated failure to secure the acceptance of veterinary advice. The work in consequence is a quarry in which future historians may dig for facts, and chapters 12 to 16, 24 and 27 will be especially useful to this end. These deal with the middle of the 19th century, when the growth of animal plagues drew attention to the importance of animal medicine in America; the establishment of the first veterinary schools, and the gradual growth of an organized veterinary profession dates from those days. A number of able graduates of the British schools founded veterinary schools in Toronto, Montreal, New York, Chicago and Illinois. LIAUTARD started a private school in New York City in 1875, and many others were started which

survived only for short periods. Out of these early attempts at education a profession was gradually developed. These chapters help to fill the gaps in our knowledge of the civil history of the profession in America.

The story of the part played by the U. S. Veterinary Service in the Great War is very complicated. The first detachment of American troops arrived in France in June, 1917, but there was no organized veterinary corps till September, 1918, and in the meantime tens of thousands of animals of the United States Army died from sheer neglect. No efficient service was evolved before the armistice and it was not until the army of occupation settled down that an organized service was developed.

This work is evidently the product of at least two minds; it was a colossal task to attempt, but certainly all the available information has been brought together.—F. BULLOCK.

REIS, J. [Chefe de Serviço, Seççao de Ornithopathologia do Instituto Biologico], NOBREGA, P. [Assistente], & REIS, A. S. [Preparadora]. (1936). Tratado de doenças das aves. [**Diseases of Birds**]. pp. 468. 359 text figs., 26 figs. on 4 plates, 45 tables. [Numerous refs.] São Paulo: Instituto biologico. [4to].

This is a very important addition to the small list of comprehensive text-books on poultry diseases and will doubtless become a recognized authority on this subject.

The subject matter is in eight sections – virus diseases, bacterial diseases, fungous diseases, protozoan infections, helminthiases, diseases associated with arthropods, nutritional diseases and organic diseases. There are 353 figures and four coloured plates, almost all being excellent, and a splendid index in which synonyms appear, so that English, French and German readers can find the place at once without having to ascertain the Portuguese name beforehand. This practice is recommended to all authors of similar books.

The authors show themselves to be very well read in international veterinary literature and have utilized the facts established by other workers to a very large extent, so that the result is a systematic treatise rather on the lines of the well-known "Special Pathology" of HUTYRA and MAREK. Information is, of course, also given about the various diseases in Brazil. There is a select reference list at the end of each special section.

The infectious diseases sections are very full and contain information on conditions with a very small bibliography, such as apopleptiform septicaemia, and the recorded attempts to infect fowls with foot and mouth disease.

The section on organic disease is rather short and very little is said about neoplasms. There are also two errors in the contents list – a spelling mistake and a wrong page number.

The printing and paper are very good, but the fragile paper binding is bad. A book of this type deserves a good binding.—J. E.

LIESS, J. [Oberassistent an der Klinik für Geburtshilfe u. Rinderkrankheiten an der tierärztlichen Hochschule, Hannover]. (1936). Die Endoskopie beim Rinde. Ihre klinische Bedeutung u. praktische Ausführung. [**Endoscopy in Cattle**]. pp. 167. 32 figs. [Numerous refs.] Hanover: M. & H. Schaper. [8vo] [RM. 7].

In accordance with the policy of the Cattle Diseases Clinic of Hanover Veterinary College to concentrate on special diagnostic methods, the technique of endoscopy has been developed for the last ten years and this book describes the present position in this field.

Although endoscopes of various sizes are desirable for different purposes, the author has concentrated on a single universal model which is suitable for use in the upper respiratory tract, the oesophagus, stomach (percutaneously in the flank), bladder, female genital tract, abdominal and thoracic cavities. It consists of a steel tube 50 cm. long and 0·9 cm. in diameter, provided with an eye-piece, a system of lenses in the shaft and a wide-angle-view prismatic objective, beyond which is the electric light bulb for illuminating the tissues.

The text is full and clear, but the figures are not so effective, being too small and too few for such a book as this – a " first guide ". A comprehensive collection of coloured figures of tissues seen during endoscopical examination would have increased its value considerably.

Apart from this criticism, the work has been well done and includes an extensive bibliography of articles bearing on this aspect of human and veterinary medicine. —J. E.

DOBBERSTEIN, J. (1936). Richtlinien für die Sektion der Haustiere für Tierärzte und Studierende der Veterinärmedizin. [**Systematic *post-mortem* Examination of Domestic Animals**]. pp. 35. 4 plates, 1 table. Berlin : Richard Schoetz. [8vo] [RM. 2.40].

This useful little book acts as a kind of prompter to the veterinary student learning to make *post-mortem* examinations. A plan for dissection is given and at each stage attention is drawn to the points which should be investigated. The first half of the book applies to the horse, and ruminants, pigs, dogs, cats and fowl are then briefly dealt with. Finally, full reports on two *post-mortem* examinations are given as a guide to their composition. Data with figures on the normal weights and sizes of viscera are also given.—J. E.

SCHÖNBERG, F. [Direktor des Instituts f. tierärztliche Lebensmittelkunde an der tierärztlichen Hochschule zu Hannover]. (1936). Die Untersuchung von Tieren stammender Lebensmittel. Eine Anweisung für die tierärztliche Praxis im Aussendienst und im Laboratorium. [**The Inspection of Food of Animal Origin**]. pp. vi + 150. 28 figs., 4 tables. [Numerous refs.] Berlin : Richard Schoetz. [2nd Edit.] [8vo] [RM. 6.80].

The laboratory examination of meat and meat products as to fitness for consumption is handled briefly yet comprehensively. The subject is treated from the purely practical viewpoint of a meat inspector having adequate laboratory facilities. Knowledge of general bacteriological technique is assumed and attention is devoted entirely to the specialized tests for detecting contamination, adulteration, etc. In addition to ordinary classes of meat (and their products, such as sausage, brawn, etc.), game, poultry, fish, crustaceans and molluscs are discussed. The book should serve as an extremely useful practical guide to those concerned with this aspect of public health.—E. J. PULLINGER.

ARLAND, A. [Prof. a.d. deutsche technische Hochschule, Prague]. (1935). Handbuch für das gesamte deutsche Schriftum der Landwirtschaft, Forstwirtschaft, des Garten- und Weinbaues, des Kleingarten- und Siedlungswesens und der Tierheilkunde mit Einschluss der Grenzgebiete Jahrgang 1934. [**Handbook of German Literature on Agriculture, etc., including Veterinary Science**]. pp. 113. Leipzig : Dr. Max Jänecke. [8vo] [RM. 2.40].

Veterinary science forms a small section of this handbook and is represented by what appears to be a complete list of inaugural dissertations from the German veterinary colleges for 1934 and by various other special papers. It is a handy list for reference purposes.—J. E.